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EDITED IN ENGLISH AND GERMAN

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ARCHIVES OF OPHTHALMOLOGY.

ON RECURRENT FORMATION OF VESICLES ON THE CORNEA AND KERATALGIAS AFTER INJURIES OF THE SURFACE OF THE CORNEA.

By Dr. W. STOOD, Barmen.

Translated from *Arch. f. Augenheilk.*, xliii., 4 (1901), by Dr. Ward A. Holden.

I WISH to describe in the following pages a clinical picture which is doubtless well known, but of which no text-book treats except that of Fuchs, and the new book by Praun on injuries of the eye; although in its characteristic development and also because of its frequency it should excite our interest. Among about forty thousand cases of eye disease I have recognized this clinical picture sixty times. The development and the course of the different cases are so similar and there are so few variations that I need not cite case histories, but only describe a type, which, with a few modifications to be alluded to later, will make the process clear.

In the beginning there is a superficial injury of the cornea usually caused by a sudden, rather blunt force. An infant scratches its mother's eye with a finger nail, a pointed leaf scratches the cornea, or a flying splinter of wood strikes the cornea tangentially. These injuries have, in common, the severity of the half blunt force and the tangential direction of its action. The result is a more or less extensive scraping off of the epithelium. The membrane of Bowman, so far as can be discovered with a loupe, remains uninjured. The injury heals in a few days and the patient believes that the recovery is to be permanent. There is neither pain nor inflammation, and vision becomes normal again. After some

weeks, or even as long as six months, the patient experiences pain on awaking, and feels that he cannot open the eye or raise the upper lid, which seems to be adherent to the ball. If the eye is forcibly opened, considerable pain is caused, lachrymation ensues, there is photophobia, and winking is painful. After half an hour or an hour, the symptoms subside and the patient may be able to take up his usual work. Examined at this time, a clear vesicle will be found beneath the epithelium, or a slight displacement of the epithelium at the site of the previous injury. Later in the day often nothing abnormal is to be found.

On questioning the patient, it may be found that the symptoms have appeared regularly on awaking for a considerable time, that the eye has been sensitive to the touch at the point of previous injury, and that smoke, dust, and conjunctival irritation increase the symptoms or cause them to appear more readily, so that he regards them of little importance, and questioning alone brings out the history. Sometimes the patient is seen in the intervals when nothing pathological can be found in the cornea, and the history alone makes clear the nature of the affection.

If one can see the patient early in the morning, the epithelial changes are clearly marked, but after three to five hours they may have disappeared entirely. These mild attacks of pain, with or without objective changes, are frequently the forerunners of a marked actual formation of vesicles on the cornea. In severe cases the lids become swollen, and the eyeball red and inflamed, and there are lachrymation, photophobia, and pain. The irritation is greater than at the time of the primary injury. Tension is not increased. The vesicle bursts, or is ruptured by the movement of the lid, and the defect is repaired without permanent changes being left, best under a protecting bandage. The pain soon subsides after rupture of the vesicle, which I usually detach with the forceps. In a week the eye is white again and free from irritation, and the site of the vesicle is not to be found.

In rare cases there are infiltration of the floor of the vesicle, hypopyon, and chemosis of the bulbar conjunctiva.

These, however, are but accidental complications, secondary infections, requiring antiseptic treatment or even the galvano-cautery and attention to the tear passages. A scar usually remains. These cases rarely recur.

But in the rarest cases the eye becomes quiet after the single eruption of vesicles. As a rule, however, there are recurrences after intervals of varying length, sometimes as long as three to six months, with eventual recovery. The latest recurrence that I have observed came on after two years. The intervals are frequently broken by mild attacks of pain in the morning, though sometimes the patient is even at this time free from annoyance. In other cases there is no visible formation of vesicles and the clinical picture is limited to the subjective characteristic annoyance of the patient. Such cases are particularly those in which the injury was a scratch or was merely a point—for example, the injuries produced by the point of a palm-leaf.

Thus the clinical picture varies in its development, but the varieties are only grades of the same process. After the healing of a superficial injury of the cornea, without involvement of Bowman's membrane, there develop after a varying interval, in which there have been but slight if any attacks of pain, clear, watery vesicles at the site of the previous injury, accompanied by severe ciliary pain and signs of inflammation. The surface of the vesicles becomes cloudy, breaks down, and is torn away, to be replaced in a short time by new transparent epithelium.

In all the attacks a characteristic feature is, that the pain is most severe on awaking from sleep. The patients all say that they are then unable to open the eye, that the lid is adherent, and that when the eye is forced open they have a sensation as of something being torn away. If the upper lid is first massaged lightly with the finger the severe pain is mostly avoided and the eye can be better opened.

Epithelial defects due to the scratching of cinders and dust or to clean cuts with a sharp knife do not, so far as my observation goes, lead to bullous keratitis, nor do cauterizations with ammonia, lime, and the like. There must always be a forcible tearing of the epithelium.

In the literature, Arlt in 1875 first described this condition as erosio corneæ. In 1884 Hansen at the Copenhagen congress reported cases as keratitis bullosa and attributed the recurrences which appeared weeks or months later to slight fresh injuries. In 1887 Horstmann reported at the meeting of naturalists in Wiesbaden a case in which a vesicle recurred nine times and definite recovery was brought about by the use of the constant current. He believed the affection to be a neurosis like herpes zoster. Grandclément observed the condition several times and described it in 1888 and 1889 as keratalgia traumatica recidiva, but he never had been able to discover vesicles upon the cornea. He believed that there was a neuritis of the terminations of the nerves. In 1889 Bronner and Nettleship wrote on the subject and recommended excision of the scar of the galvano-cautery in order to prevent the painful recurrences. In 1891 Nieden recommended the galvano-cautery even when the erosions were central. In 1896 Göring, after scraping and cauterizing the erosion in vain, obtained a cure after puncture of the cornea. In 1897 Szili and Weiss recommended the use of salves and called attention to the importance of the mechanical relations. In 1898 Hirsch reported two cases of recurrent erosion of the cornea, explaining them as traumatic neuritis of the nerve-endings with trophic disturbances, and recommending quinine. He believed that keratalgia and keratitis bullosa were but slightly different. In 1898 v. Schroeder also reported eight cases, considering keratalgia and keratitis bullosa as but slightly different, and recommended applications of 20 % silver solution. Von Reuss, on the contrary, opposed the idea of a neuralgia or neuritis, recognized only the mechanical factors, and distinguished two forms: painful attacks without objective lesions, and the development of vesicles.

Wicherkiewicz in 1899 again took up the neuritis or nerve-ending idea and considered the formation of vesicles an accompanying symptom but not an identical affection.

Among the text-books Fuchs alone, as far as I know, mentions the affection, following Arlt's designation: erosio

corneæ. Praun in his *Die Verletzungen des Auges*, 1899, discusses the matter more in detail and cites the literature. He recommends, after thorough disinfection of the conjunctiva, the use of warm wet dressings of boracic acid or bichloride solution until the epithelium regains its lustre. He believes that in this way he has best prevented recurrences.

The conceptions of the clinical picture differ greatly. In my own experience the primary injury heals readily under aseptic precautions or even without any treatment. But whether the wound has healed under a pressure bandage or not there is no difference in the matter of recurrences. If these take place, I have removed the wall of large vesicles with forceps and allowed the epithelial covering to be restored under an antiseptic dressing. As soon as the covering was restored, and in the cases of smaller or imperceptible vesicles, at once I have begun the treatment with salves and massage. Yellow oxide of mercury 1 % or boric acid in lanolin is rubbed into the eye at bedtime and left for five minutes. Then the excess is forced out by rubbing the upper lid in a circle over the cornea with gentle pressure. Thus a delicate coating of the salve is left on the cornea and lids, which prevents the drying of the fresh epithelium or its adhesion to the lid. When the patient awakes, before the eye is opened, mild massage of the upper lid and then of the cornea with the upper lid is performed and later the salve introduced into the eye.

In the thirteen years in which I have used this treatment the recurrences have been few and not severe. Rarely have there been more than two or three, often there has been but one provided the treatment was carried out properly. The galvano-cautery has been used only when the wound was infected, and internal medication has not been employed.

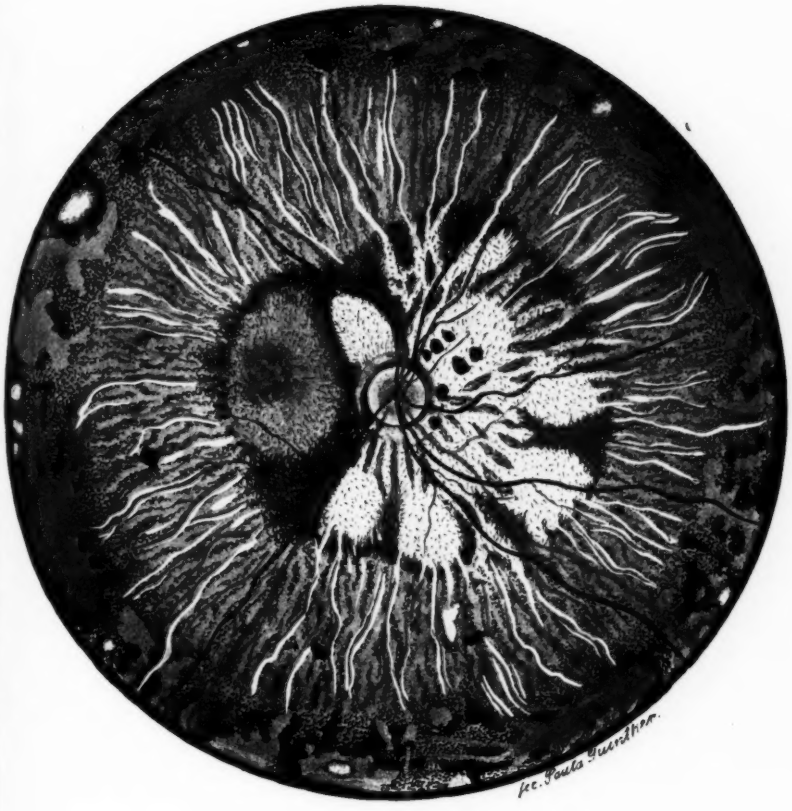
From my observations I have concluded that the process is not a neuritis of the nerve-endings in the corneal epithelium with consecutive trophic disturbances, as many writers maintain. I would seek the explanation in the anatomical relations and position of the deepest cylindrical

layer of epithelium, which, according to Rollett, Lott, and Langerhans, adheres to Bowman's membrane by means of little processes which pass into the clefts and furrows of the membrane. In the forcible injury the entire epithelium is stripped off for a distance and perhaps Bowman's membrane is crushed in its anterior layers, so that the new epithelial cells pushing in from the margins of the defect find an altered base upon which to rest and their adhesion to it is less strong. The new-formed epithelium rather rests simply upon Bowman's membrane, and at night it becomes attached to the lid and is loosened and its nerve-endings injured when the lids are opened. There follows then a passage of liquid from the parenchyma of the cornea through the nerve canals in Bowman's membrane so that a vesicle is formed.

If the vesicle is large, the overlying epithelium is so altered in its nutritive relations that it breaks down. If small, when the eye is opened the subepithelial transudation is absorbed.

This conception of a poor development of the foot-plates of the basal cells and of their weak attachment to Bowman's membrane explains also the good effects of massage. First, the entrance of the cellular processes into Bowman's membrane is facilitated, and the adhesions which form between cornea and lid during sleep are gradually loosened instead of being abruptly ruptured by the sudden opening of the eye, with injury to the cells.

In these cases I can heartily recommend the treatment with salves and massage, and I believe that we need not longer resort to the sharp spoon, the galvano-cautery, puncture of the anterior chamber, or excision of the affected portion of the cornea.



VERLAG VON J. F. BERGMANN, WIESBADEN.

ON SCLEROSIS OF THE CHOROID WITH SECONDARY DEGENERATION OF THE RETINA.

By Dr GEORG LEVINSOHN, Berlin.

Translated by Dr. Ward A. Holden.

(*With Plate XIV. of Vol. XXXVIII., German Edition.*)

CLINICAL observations on changes in the choroidal vessels have hitherto rarely been made, because of the difficulty or even impossibility of recognizing slight alterations in vessels that are covered by a membrane. Furthermore, affections of the choroid usually soon involve the retina also, which loses its transparency and prevents an accurate examination of the choroid. Therefore the observations hitherto made of changes in the choroidal vessels visible with the ophthalmoscope have been limited to the marked changes which age brings about, namely, sclerosis of these vessels. But even observations of this sort are rare. Thus in *Graefe-Saemisch*, de Wecker states that in very large scleral staphylomata the vessels often appear surrounded by white sheaths, and he quotes an observation of Knapp's in which this appearance is described as perivasculitis choroideæ. In the latest edition of Haab's atlas, plate 75 represents a very marked case of sclerosis of the choroidal vessels for a distance of 1–1½ p. d. about the disc; and Haab remarks that less extensive cases, in which the vascular changes are limited to a small area of the fundus, are not rare. The following case, resembling these, is of great interest because it exhibits clearly very marked changes in the choroidal vessels and because it presents a certain similarity to a clinical picture

recently observed by Fuchs and by him designated atrophia gyrata choroideæ et retinæ.

The patient was a tradesman of sixty, of sound, healthy constitution. He had passed through three military campaigns, had been married for 33 years, and had two children. He had never been seriously ill, had never had syphilis, there had not been abuse of tobacco or alcohol, and there was no consanguinity of parentage. Urine normal.

For about seven years the patient has noticed a diminution of vision. The weakness of vision is more manifest in the evening and now has become so excessive that he is unable to go about alone in the evening.

The functional condition of the eye has changed but slightly in the last six months while the patient has been under our observation. Apart from the reduction of the light sense, which has remained fairly constant, vision six months ago was R $\frac{4}{7}$, L $\frac{4}{10}$ and now is R $\frac{4}{10}$, L $\frac{4}{15}$. With +3, Schw. 0.4 at 25 cm. The field of vision also has remained almost unchanged. Six months ago the fields were concentrically contracted down to 10° from the point of fixation, except for a narrow circular peripheric zone 10° wide, interrupted above. The color sense at the point of fixation was normal in the two eyes. Now the condition of the fields is as before, except that the peripheric zone of vision has been broken downward and inward in the left eye.

The objective examination reveals the following condition: The pupils are slightly irregular in form and react sluggishly to light and in convergence. In both lenses are slight senile changes limited to the equator. The posterior portion of the vitreous is filled with numerous punctate, slightly moving opacities. The anterior portion of the vitreous is free. The condition of the fundus also is nearly identical in both, so only the left fundus need be described. The disc has a red color, but on the whole appears pale. The veins are slightly constricted, the arteries markedly so. About the disc the fundus presents the picture of advanced atrophy of the choroid. This may be divided into three zones. The disc is surrounded by a narrow light zone, yellowish-red in color,

broken below by a small patch of normal red color (Plate XIV). To the macular side is a light red area, about 3 p.d. in diameter, whose centre, corresponding to the macula, appears dark red. To the nasal side and above and below the disc are large white or yellowish fields between which isolated bits of red fundus can be seen. The limits of these white fields and the light red macular area are characterized by brown pigmentation of the choroid. There then follows a broad circular zone reaching to the equator, which is noticeably lighter than the normal fundus, and in it the choroidal vessels are clearly seen enclosed in more or less intensely white sheaths, sometimes, however, bordering one side of the vessel only. At some points the blood column is no longer visible and the vessel is indicated by a white stripe. The arrangement of the various vessels is manifold. Occasionally white-sheathed vessels or white stripes pass over into normal red vessels; the latter then are mostly very tortuous.

The white-sheathed vessels can be followed into the circumpapillary zone, and in the other direction out beyond the equator. Here and there, besides the white fields, small areas of white color are visible, into which usually a small vessel enters. It is noticeable that the vessels entering the venæ vorticosæ exhibit the same changes, though in lesser degree. The twigs coming from the anterior part of the fundus and the main trunks have a normal appearance, but the branches posteriorly mostly have white sheaths. From the equator forward the fundus has a fairly normal appearance, except for the presence of small round atrophic choroidal patches.

A few words should be said in regard to the retinal pigment. The pigment epithelium is visible from the disc to the equator as a fine dark stippling. This stippling at many points is but little pronounced, although even over the large white foci it is still partially visible. Besides this, numerous spots of coal-black pigment are deposited at various points in the retina. Some of these possess the bone-corpuscle appearance of the pigment spots in retinitis pigmentosa, and these are more numerous in the nasal half of the fundus.

In the equatorial region the pigment is arranged in great clumps among the small round atrophic spots.

Taking the clinical picture as a whole we have here, first, changes found in moderate degrees of retinitis pigmentosa: pallor of the disc, narrowing of the vessels, and the irregular deposition of pigment in the retina indicating atrophy of the retina; second, a marked atrophy of the choroid exists, extending nearly to the periphery and otherwise leaving only the macular region free. Near the disc the choroidal atrophy appears in the form of large white areas beneath the retinal vessels. Farther from the disc the choroidal atrophy is recognizable in the lighter tint of the fundus and the clearness with which the choroidal vessels are seen. The peculiar changes in the vessels themselves, however, is the feature that particularly characterizes the clinical picture.

The question may now be discussed as to how the clinical picture developed. We can hardly go wrong in assuming that the affection was first localized near the disc, because the changes here are more marked. Then it may safely be assumed that the large white foci represent only a higher degree of atrophy and at first had the appearance now presented by the parts farther in the periphery. It is also scarcely to be doubted that this atrophy of the choroid was caused by the changes in the vessels and that the atrophy kept pace with the destruction of the vessels. Similarly, the sluggish pupillary reaction may have been due to an atrophic process in the iris proceeding from vascular changes.

It is also possible to diagnose with considerable certainty the pathological process affecting the vessels. If then we take into account the age of the patient, and remember that previously vision in the two eyes had been good, and that the affection has had a very chronic course without any inflammatory reaction, it seems highly probable that the changes which have taken place in the choroidal vessels are to be regarded as of a senile nature and the process as a vascular sclerosis. This sclerosis affected not only the arteries but also the veins of the choroid, although the changes in the latter are slight. We saw above that the

trunk of the vortex veins had a normal appearance, but that the branches entering it from behind were altered in part in the manner described. The localization and the development of the clinical picture are thus rendered comprehensible. Since the sclerosis affects first the larger arteries, and these enter the eye near the disc, the process must begin in this region and the more peripheric parts will be affected later and with less intensity.

The retinal atrophy is to be regarded as dependent upon the choroidal atrophy. The relatively slight atrophy of the former and the advanced atrophy of the latter render this very probable. Also the presence of a large portion of the pigment epithelium speaks for a primary affection of the choroid. One might suppose that the retina simultaneously with the uvea became atrophic through vascular changes. But no trace of sclerotic change is visible in the retinal arteries, and on the other hand a choroidal atrophy so well marked as this may well affect the retina in this way. We know that in typical retinitis pigmentosa the process develops in a similar manner. Therefore the dependence of the retinal degeneration upon the choroidal atrophy is very probable in our case.

This case is of the greatest interest because of the advanced and extensive sclerosis of the choroid, which is the more striking as the organism otherwise presents no marked evidences of vascular sclerosis. It is interesting also on account of the co-existence of atrophy of the retina and of the choroid, which has been seldom observed. Altogether five cases are on record, one reported by Jacobson in Zehender's *Monatsheften* in 1888, and four reported by Fuchs in THESE ARCHIVES (German edition, vols. xxx.–xxxii.) in 1896. Fuchs, who considers this a particular form of disease — atrophia gyrata choroideæ et retinæ,—noted its similarity to retinitis pigmentosa. He showed that in both, heredity and consanguinity of parents play a considerable rôle, that both begin in childhood with hemeralopia, and that only the existence of marked atrophy of the choroid distinguishes the affection from retinitis pigmentosa. But is our case identical with Fuchs's atrophia gyrata? This question must be answered

in the negative, for our case is distinguished from the others by its commencement and by the visible changes in the choroidal vessels. On the other hand, they have in common the great similarity of clinical symptoms, the course of the affection, and the dependence of the retinal degeneration upon a primary chronic affection of the choroid.

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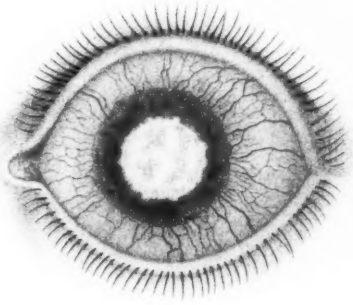

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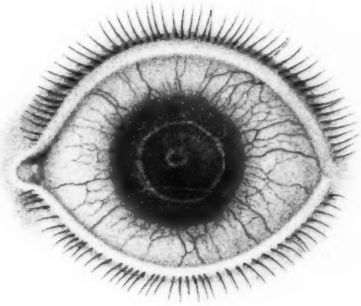

Lith. Anst. v. H. Jonas, Cassel. Verlag v. J. F. Bergmann, Wiesbaden.

ON A MYCOTIC AFFECTION OF THE CORNEA.

By Prof. B. WICHERKIEWICZ, Cracow.

(With two figures in Plate XXIII. of Vol. XL., German Edition.)

Translated by Dr. Ward A. Holden.

DISEASES of the cornea caused by microbes are seen frequently, and are treated often with good results, but fungi seem to affect the eye, and particularly the cornea, but rarely.

Up to the present time only a few cases have been reported. Therefore, I take the opportunity to report a case caused by a fungus different from that found in the other cases reported.

On June 18, 1889, a laboring woman of twenty-three was received in the clinic with the following history :

Three weeks before, while digging potatoes, she was struck in right eye by a bit of dirt. The eye became painful and a physician was consulted, who instilled something and ordered flaxseed poultices. The eye became worse and she came to the clinic.

When received, both lids were a little swollen, and the bulbar and palpebral conjunctiva markedly injected, but smooth. Numerous superficial dilated vessels passed to the limbus, which, greatly injected, formed a red ring, covering the sclero-corneal junction. (Fig. 1, Pl. XXIII.) From this ring finer radiating vessels passed in regular arrangement toward the middle of the cornea which was occupied by a tough, yellowish-white homogeneous mass. This mass was nearly round, having a diameter half that of the cornea, an irregular outline, and an elevated uneven surface. The vessels were most numerous below. But through the vessels one recognized a light background limited

above by a horizontal line, and below by the margin of the cornea. When the head was bent over, this horizontal marginal line seemed to change position.

The eye was not particularly painful or sensitive to the touch.

T N. V = p. l.

The neighboring tissues were not affected and the lachrymal apparatus was normal.

At first glance the condition seemed to be one of corneal ulcer with destruction of tissue and hypopyon, but the slow course, the mild reaction, and the peculiar appearance of the necrotic tissue which protruded above the surface of the cornea and was resistant when touched with the probe, excited my suspicion that the affection was possibly of mycotic nature.

Bits of the infiltrated masses therefore were removed and placed in bouillon and on agar.

Treatment was as follows: atropine twice daily, 10 % xeroform ointment once daily, boric-acid fomentations, and an occlusive bandage at night. No particular change followed several days' treatment.

The cultures were by accident destroyed, but being convinced of the mycotic nature of the affection an operation was resorted to twelve days after the patient's admission.

An effort was made to remove the mass with a sharp spoon, but it was so resistant and so tightly adherent to the cornea that the effort was unsuccessful. With a Graefe knife the superficial layers were removed, but it was not thought advisable to attempt to remove the deeper layers.

The operation was well borne, and the same treatment was continued and gradual improvement took place.

July 18th, the following notes were made:

The cornea has its normal curvature and is smooth except for a gray spot, as large as a pin-head, in the centre which is not covered with epithelium. This spot is surrounded by a broad ring of cornea covered with a fairly thick superficial vascular network; peripheral to this is a fairly regular gray circle almost concentric with the sclero-corneal junction and separated from the latter only by a dense network of superficial vessels. The vascular network covering the sclero-corneal junction is now narrower and paler, and the conjunctival injection is less. In place of the previously existing hypopyon is a gray area limited above by a convex line. (Fig 2, Pl. XXIII.)

The vision remained unimproved since the cornea was still almost entirely opaque. July 20th the patient was discharged and was not seen again.

Cultures from the mass removed at the operation gave rise to flat, dark-gray colonies and Prof. Bujwid, who kindly examined them, stated that the fungus belonged to the pencillium glaucum variety.

Microscopically one saw only a dense mass of threads with a few cells among them, and no trace of corneal tissue could be discovered.

As mentioned before, mycosis of the cornea is extremely rare if one may judge from the small number of cases reported, although it is not impossible that cases of this sort have sometimes been mistaken for hypopyon keratitis. Up to this time[1] only three cases have been reported, to my knowledge. Leber first called attention to the affection nearly twenty years ago.[2] Uhthoff[3] in 1882 carefully studied a case previously reported in a dissertation by Berliner.

Fuchs described a third case[4] and discussed the earlier cases fully, so that I shall say but a few words in regard to them here.

Leber's case due to the aspergillus fumigatus and Fuchs's case arose in some unknown way, but in my case the pencillium glaucum was transported to the eye through the medium of a bit of earth. In Uhthoff's case the eye was injured with a pear, and the variety of the fungus was not determined. Fuchs suggested that his patient, a miller, had possibly first suffered a loss of epithelium through herpes febrilis in which flour dust, containing the fungus, had lodged.

Thus, in three cases, the inoculation occurred from a body causing direct injury, and only in Fuchs's case was the mycotic affection probably secondary.

The clinical picture is so characteristic, that the affection

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[1] February, 1900.

[2] *Graefe's Archiv*, xxv., 2, p. 285, 1879.

[3] *Graefe's Archiv*, xxix., 3, p. 178.

[4] *Wiener klin. Wochenschr*, 1894, No. 17.

will be recognized even if one has not previously seen a case. Although it may resemble that of hypopyon keratitis, it is distinguished by the unusually slow course and the slight subjective symptoms and the unimportant accompanying symptoms even when the corneal changes are pronounced. The uveal tract in particular exhibits little disposition to become involved.

The tissue resembling necrotic cornea is elevated above the normal level of the cornea, and is more resistant than the necrotic tissue of keratomalacia, and has a fairly sharp outline. My case would seem to indicate that the fungus grows as a saprophyte on the injured cornea but does not pass into the healthy portions of the cornea, otherwise the restoration of the form of the cornea would be impossible. However, Leber's inoculation experiments have shown that fungi may grow in the living rabbit's cornea, and it seems probable that in the three caess cited the fungi had entered the cornea and partially destroyed it. Whether perhaps the pencillium glaucum acts in a different manner from the aspergillus must still be determined by experiments on animals.

However, in my case there was no destruction of corneal tissue and the fungus carried to the injured spot developed here and spread over the surface of the cornea. The vessels developed by the irritation formed a wall preventing further extension and also protecting the underlying tissues.

What therapeutic measures are to be employed in a case of keratomycosis? The cases so far reported offer us little information in this respect.

Fuchs removed the diseased parts with forceps and scissors, chiefly, however, for more careful examination, and although this may have influenced the course of the disease favorably he did not neglect to employ the remedies usually employed.

In my case a radical operation might have hastened the recovery, but I refrained from attempting such an operation because the diseased parts were so intimately connected with the healthy cornea, and because I wished to observe the course of the disease, which was not threatening the eye or particularly annoying the patient.

The colonies, in fact, grew smaller, and the hypopyon cleared up under the use of xeroform, which has been of good service in microbic affections of the cornea. Whether other remedies would have been more efficacious is a question which must be decided by further observations.

REVIEW OF SIXTY-NINE CASES OF RUPTURE OF THE CHOROID, COMPILED FROM THE RECORDS OF THE NEW YORK OPHTHALMIC AND AURAL INSTITUTE.

By F. E. D'OENCH, M.D., New York.

THE cases upon which this report is based were taken from the records of the New York Ophthalmic and Aural Institute, and cover a space of thirty-three years, and were compiled from a total number of over 150,000 patients. The compilation was not undertaken with the object of entering into the discussion of the mechanism of rupture of the choroid, as that is a problem, the practical and theoretical side of which has been discussed at great length by Hughes, Franke, and others, but rather to note what inferences, if any, could be drawn from a large number of cases.

As might naturally be expected, the male sex suffered far more than the female sex, on account of its being much more frequently exposed to injuries, the ratio being fifty-three to sixteen, or more than three to one. The greatest number of accidents occurred in early life, between the ages of ten and forty. The following table shows the relative numbers arranged in decades:

Under	10			4
Between	10	and	20	23
"	20	"	30	18
"	30	"	40	15
"	40	"	50	3
"	50	"	60	0
"	60	"	70	1

In five cases the age was not mentioned.

As to the seat of the rupture, the statistics bear out the observation that it occurs most frequently to the temporal side of the disc, between it and the macula, corresponding to the impact of the force. In only twenty-five cases was the seat of the rupture mentioned, but in ten of them it took place between the optic nerve and the macula, or in 40 %. In two cases it was downwards and inwards, in two at the macula, in five downwards, in three downwards and outwards, in one upwards and inwards, in one there was a double rupture, one on the temporal, the other on the nasal side, and in one there were four horizontal ruptures, above and below the disc. In four cases multiple ruptures of the choroid were noted, in the others they were isolated, though in many the number is not stated. One eye was injured just about as frequently as the other, the right in twenty-three cases, the left in twenty-four; in the others no mention is made whether it was the right or the left.

Numerous complications attended the injury, *the most frequent being hemorrhages*, which were noted in eight cases. Sometimes the blood entered the vitreous, this being noted in three cases, while the floating opacities observed in three others probably had the same origin. Another complication was *atrophy of the optic nerve*, observed in seven cases, and extending to the uninjured eye in another. I do not doubt that this is a result which would be noted much more frequently if the patients could be kept under observation for a year or more, as naturally it would not take place immediately, but as they soon learn that nothing can be done for them they are soon lost sight of. Other complications were *iridodialysis*, observed four times; *detachment of the retina*, one case; *connective-tissue formation* in the retina, three cases; **traumatic cataract**, two cases.

The rupture is almost invariably due to a direct blow upon the eye, but in one case the injury was inflicted with a toy shovel upon the bone, just below the outer canthus.

The *sight which these injured eyes subsequently obtained varied considerably*, usually falling below $\frac{20}{200}$. Unfortunately the notes are defective in this respect, a record of

the sight being found in only twenty-five cases. Some showed distinct improvement, for instance from $\frac{10}{200}$ to $\frac{20}{40}$, while two regained V = $\frac{20}{20}$. These cases are such unusual ones in this respect that I append the notes.

John D., aged eleven. Rupture of choroid R. The boy while playing was struck with a stone, making an incised wound beneath the lower lid. Crescentic rupture of choroid with hemorrhage between optic disc and macula. Visual field complete; R V = $\frac{20}{40}$, bad illumination. + T 2. Two days later: External wound healed; periost. orbit. Intense hyperæmia of retina with swelling in region of rupture which obscures the latter to a certain extent. R. E. $\frac{20}{40}$ with good illumination. Two days later V = $\frac{20}{30}$; eleven days after being first seen V = $\frac{20}{20}$.

The other case was that of a young man twenty-one years old, who was struck with a baseball bat six months before he presented himself at the dispensary. His sight was $\frac{20}{30}$. There was also paralysis of accommodation. Unfortunately there are no notes besides this.

In one case the patient was seen after seven years, when V = $\frac{7}{200}$; another eight years later, whose sight had practically remained the same, having risen from $\frac{8}{200}$ to $\frac{3}{200}$.

A third was seen after two years, when V = $\frac{10}{200}$, and a fourth after six months, when his vision was $\frac{20}{70}$.

The varying state of the visual acuteness, especially the frequency of its great reduction, calls attention to the fact that it is not only the choroid which is affected by the injury, but also other parts of the eye, and probably the retina most of all. We know that extensive changes may take place in the choroid without affecting the acuteness of vision, but even slight changes in the retina are of much importance in this respect. The retina is made up of transparent elements, and under ordinary conditions escapes observation, and it is therefore probable that an injury sufficiently great to rupture the choroid will produce changes in so delicate a structure, which, though invisible to the observer may cause most marked subjective disturbances. More severe blows may lead to subsequent changes which are readily apparent, such as atrophy of the nerve and marked pigmentation in the neighborhood of the rupture,

which may partly be due to organization of the escaped blood, partly to proliferation of the choroidal or retinal pigment.

In conclusion I would like to call attention to one feature of injuries of this kind, and that is their forensic aspect. The physician may be called upon to give his testimony as to what extent the eye was injured, and such testimony may be of the greatest importance in deciding the question of damages. A case from my own practice may illustrate this:

L. V., aged forty-five, was struck on the left eye with the fist six weeks ago. $V = \frac{1}{200}$; with $-\frac{1}{11}$ cax 75° n $\subset +\frac{1}{40}$ cax 15° t $V = \frac{1}{100}$. In the right $V = \frac{1}{10} -$; with $-\frac{1}{9}$ cax 75° n $V = \frac{1}{30} -$. A small rupture of the choroid passes directly through the region of the macula, close to the fovea centralis. Had the injury taken place at another part of the fundus, its smallness would in all probability have led to a much less marked disturbance of vision. The man did not sue his opponent, as far as I know, probably because he himself was to blame.

A CASE OF LOCALIZED TUBERCULOSIS AT THE HEAD OF THE OPTIC NERVE; MICROSCOPIC EXAMINATION.

By Dr. ARNOLD KNAPP.

(*With one figure on Text-plate I.*)

C. L., a two-year-old negro child, had always enjoyed good health. The parents are apparently healthy; a grandmother died of phthisis and another child presented some tuberculous manifestations in the first years.

Four months ago it was noticed that the left eye diverged and the pupil of the eye appeared white.

On examination, October 8, 1901, the left eye is free from inflammatory signs. The iris is normal, the media are clear. The retina is totally detached and its blood-vessels are easily visible by oblique illumination. Tension is normal. The other eye is perfectly healthy. The child is bright and well nourished. Physical examination reveals no abnormity. The eye is enucleated on the probable diagnosis of glioma.

After hardening in formol the eyeball is divided in the anteroposterior diameter.

Macroscopic examination: The anterior segment of the eye is normal. The retina is totally detached and includes a central funnel-shaped cavity. The subretinal space is filled with an opaque gray coagulum. The apex of the detached retina is occupied by a solid circumscribed white tumor about 0.6 *cm* broad. This tumor anteriorly projects into what remains of the vitreous chamber, is bounded laterally by the retina and posteriorly extends into the optic nerve for about 0.1 *cm* in its outer half, where it also appears to invade the neighboring choroid.

Microscopic examination: The tumor is composed of diffuse granulation tissue with many giant cells and miliary tubercles and a central large area of necrosis. All the retinal structures in the

To illustrate Dr. Arnold Knapp's Case of Localized Tuberculosis at the Head of the Optic Nerve.

neighborhood of the disc are obliterated by the morbid process. Beyond, the retinal elements are hypertrophied and the growth extends farther in the nerve-fibre layer. On one side the choroid is infiltrated with this same tissue and immensely thickened. This infiltration ceases abruptly; the new tissue is of recent date and shows no signs of caseation. Two additional areas of infiltration are situated in the choroid more anteriorly; but no change is observed in the area anterior to the equator. At the optic nerve the growth has extended backward in the substance of the nerve with sharply defined outline. The neighboring part of the nerve is moderately inflamed, the normal markings are gone, the vessels dilated, and the nuclear elements increased. The optic-nerve sheath is completely filled up with cellular elements, small, round, and epithelioid in character, showing at the site nearest to the affected choroid a miliary grouping. Staining for tubercle bacilli was positive.

Shortly after, the child developed a swelling in one elbow, later the tuberculous condition became more general.

October 27, 1902, both elbows are involved; there is cough and hectic fever. No clinical manifestations of meningeal involvement.

From the histological examination it seems proper to assume that the ocular lesion began in the retina, as the morbid process is most advanced in the retina and neighboring part of vitreous body, while the changes in the choroid seem recent.

Localization of a tuberculous focus in the retina is extremely rare. Michel[1] says that tuberculous nodules are sometimes visible in the optic papilla, especially at the margin, as small yellowish round protuberances; the entire papilla may even appear as a yellowish red surface with white threads suspended from it and red nodules (like grapes) projecting into the vitreous. Dr. Bailey,[2] in 1882, published a case in a man of twenty-seven, where the ophthalmoscope revealed a grayish mass bulging forward to the disc, but separated apparently by a horizontal crease. The eye showed a detached retina; projecting from region of papilla was a mass the size of a pea with all the histological characters of tubercle.

[1] Quoted by v. Herff: "On Tuberculosis of the Optic Nerve and Chiasm." *Inaug. Diss.* Würzburg. 1893. [2] Bailey. *Medical Times*, vol. ii., p. 747.

O'Sullivan and Story[1] published a case of tuberculosis of the retina which resembles our case in an earlier stage and where the diagnosis was made before removal of the eye. Their patient was a healthy young woman of twenty-one. Ophthalmoscopically, the right eye presented the appearance of an intense papillitis with the exception that the papilla was extremely white and presented an unusual swelling. On dividing the eye, a tumor was seen to protrude at the posterior part of the retina just around the entrance of the optic nerve. The retina was moderately detached. Microscopically the tumor was typically tuberculous. The optic nerve was unaffected.

As example of a subsequent stage of this process, the following case may be cited. Sattler[2] described a case with the same intraocular condition as above, associated with a tuberculous tumor in the orbit.

Exophthalmos was present; the disc and surrounding area were occupied by a white mass. At operation a cylindrical tumor was found surrounding the optic nerve. Microscopically the optic nerve was converted into a mass of tuberculous granulation tissue. The sheath was infiltrated with lymphoid cells. The papilla was swollen and contained many lymphoid cells and submiliary tubercles, which had invaded the neighboring retina and choroid. The rest of the eye was normal. The child subsequently died of tuberculous meningitis. The primary infection was supposed to have taken place from caseated bronchial lymph nodes.

On the other hand, the retina and optic nerve have become involved secondarily to tuberculosis of the uveal tract in a number of reported cases.[3]

Nearly all of the cases observed have occurred in young individuals, and principally in childhood.

The accompanying illustration was taken from a photograph, for which I am indebted to Dr. E. Harlow.

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[1] *Trans. Royal Acad. Medicine of Ireland*, vol. xvii., p. 451.

[2] *Graefe's Arch.*, xxiv., 3, p. 227.

[3] Bongartz: "On Distribution of Tuberculous Infection in the Eye." *Inaug. Diss.* Würzburg. 1891.

A METHOD FOR THE PREVENTION OF SYMBLEPHARON AFTER BURNS OF THE CONJUNCTIVA.

By Dr. E. F. SNYDACKER,

ASSISTANT SURGEON, ILLINOIS EYE AND EAR INFIRMARY.

(*With two diagrams in text.*)

OUR methods of treatment in conjunctival burns do not, as a rule, yield satisfactory results. Any means, therefore, which are apt to prove of benefit in this class of cases are well worth reporting.

J. M., a laborer, came to me in September of this year, suffering from a severe lime burn of the conjunctiva of the left eye, which had occurred about thirty hours before.

At the time he presented himself the lids were red and greatly swollen, there was a profuse muco-purulent discharge from the eye, the cornea was hazy, the iris minutely contracted, the conjunctiva intensely red and chemotic. The burned area involved the conjunctiva of the lower lid, the cul-de-sac, the lower portion of the bulbar conjunctiva, and a small portion of the lower part of the cornea, extending upward from the limbus about 2 *mm.*

The breadth of the burn was least in its upper portion, greatest in its lowest, forming, roughly speaking, a funnel whose point rested on the lower part of the cornea, whose base was formed by the lower part of the bulbar conjunctiva, the cul-de-sac, and the lower part of the palpebral conjunctiva.

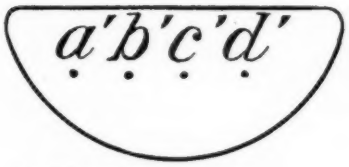
This area did not form one continuous mass, but seemed rather to consist of coalescing points.

Sloughing had already begun, and those parts which had been burned stood out as grayish-white islands, surrounded by red, velvet-like conjunctiva. That part of the cornea involved in the burn was white and lustreless, the rest of the cornea hazy Vision, $\frac{20}{200}$.

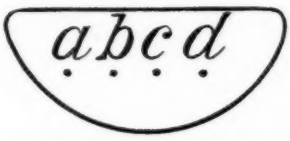
The only other case of extensive burn of the conjunctiva which I had had under my care was that of a simple-minded girl, who had attempted to boil rice in a tightly closed vessel, and both of whose eyes had been severely burned by the resulting explosion. In that case, the attempt had been made to prevent adhesions between lid and eyeball, by the frequent instillation of vaseline and the forcible separation of the lids from the eyeball every two hours night and day. The result was eminently unsatisfactory.

I therefore determined to pursue other methods in this case, and the following was the device employed.

A lead plate, a little less than 1 *mm* in thickness, was cut out so as to fit accurately between the lower lid and the eyeball, being adjusted firmly into the lower cul-de-sac, so as to put it on the stretch. Over this plate on the anterior or skin surface of the lid a somewhat larger plate was fitted. Each plate was perforated by four holes.



Outline tracing of outer plate.



Outline tracing of inner plate.

From within outward, through the holes in the plates, passing throughout the thickness of the lid, two double-armed sutures were passed.

One needle of the first suture was passed through the hole of the inner plate at *a* through the thickness of the lid and emerged at *a'*, the other needle passed in at *b* and out at *b'*, the two ends at *a'* and *b'* were tied moderately tight, so as to hold the plates firmly, but not to exert too much pressure on the lid.

The ends of the sutures were not cut, but left hanging ; in the same manner the two needles of the other suture entered, one at *c*, the other at *d*, emerging respectively at *c'* and *d'*; the ends were firmly tied and also left hanging.

I then had the lid sandwiched in between two plates, which were held in place by means of two sutures passing through holes

in the plate and through the whole thickness of the lids, with the four ends of the two sutures hanging down over the cheek. Each end was then fastened to a strip of one-inch gauze. These strips, in pairs of two each, were passed down under the chin, the inner one to the left the outer one to the right, being drawn aside so as to avoid the mouth as much as possible, then turned backward, made to encircle the neck firmly several times, and tied over the nape of the neck; to avoid the mouth, however, the inner strip of each pair had to pass over the nose; the act of chewing, too, tended to dislodge the strips somewhat, so, after the first day, that method was abandoned and the following employed, which worked admirably: the length of each strip was increased to about three yards; each strip was then passed directly downward under the chin, turned to the right (the injured eye being the left one), passed completely under the chin, then up over the top of the head passing behind the ear, then down again under the chin, and so made to encircle the chin and the top of the head five or six times. The bandages were fastened in the desired positions by safety pins; the bandages having been starched and adjusted while damp, when they became dry had absolutely no give to them. The patient could open the mouth but very little, and so while the bandage was in place had to subsist mainly on fluids, which he drank through a tube.

By this method any desired amount of tension could be put on the lower lid, and I found no difficulty whatever in completely everting the lid, keeping it everted, and at the same time exercising a constant and considerable degree of tension.

The lower lid was kept in this position for eleven days; at the end of the third day a stitch abscess developed about one of the sutures; this was easily remedied by changing the place of the suture; at the end of the seventh day I again changed the suture, in order that I might crowd the inner plate deeper into the cul-de-sac and cauterize granulations behind it.

The next time I have occasion to use this device, I shall change the shape of the inner plate; instead of having the plate flat, I shall have the lower edge of the plate made much thicker than the rest, with the edges, of course, rounded; the plate can then taper off toward the upper edge, forming a wedge or prism-shaped body of which the lower edge forms the base; this kind of a plate can be

crowded into the cul-de-sac, so as to press out the folds completely, and that without causing the patient pain.

We must not forget that the lower cul-de-sac is not a simple bag of mucous membrane, but consists of a number of diverticula or folds, and I consider it one of the essential features necessary to treat this class of cases with any measure of success, to prevent adhesions between the sides of these diverticula and subsequent obliteration of the folds, by keeping them well pressed out and on the stretch, and then, when the inevitable subsequent shrinkage of the conjunctiva occurs, instead of having the bulbar conjunctiva drawn in bands, toward the lid, the conjunctiva of these folds may furnish enough mucous membrane, so that even if considerable shrinkage does occur, this disagreeable contingency may be obviated.

There is, of course, no danger to the cornea in keeping the lower lid everted for such a length of time, as it is protected by the upper lid. I, however, constantly kept a moist gauze pad over the eye, and found that by this means the spasmodic tendency of the lower lid to close was much diminished.

At the end of the fifth day small granulations were springing up freely over the burned area. After cocainizing the eye I carefully cauterized them with the nitrate-of-silver stick; this also was repeated on the seventh and ninth days.

The burn on the cornea gave no particular trouble, and at the end of four or five days was covered with epithelium.

At the end of eleven days the plates were removed; at no place did any bands of adhesion form between lid and eyeball, and while at the present time (almost two months after the accident) the fornix may be somewhat diminished in depth, due to subsequent shrinkage of the injured area, a distinct cul-de-sac still remains, and with the exception of the damage done to the cornea (vision $\frac{20}{60}$) there has been no impairment of the function of the eye. Of course, a merely mechanical device can only accomplish mechanical results. The plates, by their interposition, can prevent direct adhesions between lids and eyeball, by the tension exerted

the healing surfaces can be put and kept on the stretch and shrinkage diminished, the folds of the cul-de-sac can be crowded apart and saved from obliteration, affording free mucous membrane when shrinkage occurs, and lessening liability to formation of bands between lid and eyeball.

When extensive areas of conjunctiva have been destroyed, subsequent contraction will inevitably follow; this is especially disagreeable where palpebral conjunctiva has suffered, for the conjunctiva not being movable over the lid, when contraction occurs the conjunctiva of the eyeball is drawn in bands toward the lid, causing all the disagreeable disturbances of direct adhesion between lid and eyeball. These are the contingencies which we strive our utmost to avert and lessen.

Any one who has watched the granulations spring up over such an injured area, and the great tendency for the different islands of granulations to unite and coalesce, will recognize the value of careful and thorough cauterization, and frequently one will see after touching a small granulating area with the stick how it will shrivel up, and how in a day or two the mucous membrane has crept in and covered a place where otherwise bands of connective tissue would have formed.

Of course the interposition of a foreign body to prevent symblepharon in burns or injuries of the conjunctiva where opposing surfaces are denuded is almost as old as ophthalmology itself.

A rag smeared in salve or oil, rubber plates, wax plates, glass plates, lead plates—all have been advised.

The device here described, however, has the great advantage not only of interposing a foreign body, but of completely separating the wounded areas and keeping them stretched apart under constant tension while healing is taking place, and, equally important, of crowding apart the folds of the cul-de-sac and preventing their obliteration.

Fuchs, in his text-book (seventh edition, p. 130), says a symblepharon must of necessity result where the denuded surfaces extend into the fornix, and are continuous with one another, for where you have raw surfaces meeting at an

angle, adhesion starts at the angle and draws the surfaces together.

Czermak (*Die augenärtlichen Operationen*) emphasizes the same idea, and states as the objection to the interposition of a plate, the fact that it is forced up by healing from below, and by the contraction when the opposing surfaces of the fornix unite.

These objections, however, are obviated where the opposing surfaces are not only separated from each other by a plate, but are drawn apart and kept drawn apart under constant tension till the surfaces are covered; furthermore, I think the starting-point of adhesion and contraction is not so much at the angle of the cul-de-sac as between the walls of the diverticula.

Thus far I have had no opportunity to employ this device after a plastic operation, where we wish to keep the lid separated from the bulbus under tension; here, too, however, it seems to me, the method should yield good results.

REPORT OF THE MEETING OF THE GERMAN OPHTHALMOLOGICAL SOCIETY AT HEIDELBERG, AUGUST 4–6, 1902.

By Prof. RICHARD GREEFF, Berlin.

Translated by Dr. Ward A. Holden.

FIRST SESSION, MORNING, AUGUST 4TH, DR. DOR (LYON) PRESIDING.

1. Roemer (Würzburg). **Further investigations on the serum therapy of corneal ulcers.**

Roemer has looked up the statistics of some of the benevolent societies in regard to injuries of the eyes. These statistics show the great social importance of serpent ulcer, which comprised more than half of the eye injuries reported as accidents.

Year	Number of eye injuries passed on	of which were serpent ulcers	%
1889	3	—	—
1890	7	2	28.5
1891	16	3	18.7
1892	11	2	18.1
1893	12	7	58.3
1894	17	12	70.5
1895	29	11	37.9
1896	29	11	37.9
1897	38	24	63.1
1898	60	29	48.3
1899	45	30	66.6
1900	50	26	52
1901	55	33	60

Since the passage of the accident insurance laws many millions of marks have been paid out in Germany because of serpent ulcers. If this infectious disease is adapted for a specific prophy-

laxis and serum therapy, it must be a specific infection. The author confirms the results of the investigations of Uhthoff and Axenfeld. In the past year he has examined by means of cultures 80 cases of serpent ulcer and has found the Fraenkel diplococcus in 95%. The second condition in regard to the possibility of serum therapy is the fact proved by Roemer that the eye takes part in general immunity. Now with the discovery of antitoxin in the anterior chamber he has completed his investigations and reports in conclusion his clinical experience with the pneumococcus serum in eight cases of incipient serpent ulcer. All the cases were checked and recovery ensued. From these observations on men Roemer abstains from drawing conclusions as to the curative value of serum therapy. He believes, however, that he is justified in expressing the hope that the antitoxin may serve as a specific prophylactic by rendering the organism immune and thus preventing the development of serpent ulcer if used early.

Discussion.—Axenfeld recommended the prophylactic extirpation of the diseased lachrymal sac.

2. RAEHLMANN (Munich). **On trachomatous affections of the lid margin and tarsus.**

While all the other inflammatory affections of the conjunctiva practically never involve the tarsus, in trachoma this involvement is so frequent and regular as to render it probable *a priori* that the tarsus actually takes an individual part in the disease. Clinically this participation of the tarsus is recognizable through a change in the secretion of the glands imbedded in it. The secretion of the Meibomian glands, which in normal conditions is clear and transparent and scarcely recognizable, is poured out in considerable quantity as soon as follicles lie on the tarsus and conjunctiva; it becomes cloudy and, when the follicles are numerous on the tarsus and particularly when they have ulcerated, it contains crumbling masses and small hard concrements and is of a foamy character. Sometimes the altered secretion appears, when the lid margin is compressed, like the curved stringy secretion which is expressed from a comedo. This secretion covers the lid margin in pronounced cases, and, if there is entropium, finds its way into the conjunctival sac and lies in masses in the retrotarsal folds. The ducts of the glands where they open on the lid margin appear normally as fine points, but in trachoma they become larger and more prominent.

When numerous follicles are in a state of ulceration or cicatri-

zation, the posterior portion of the lid margin becomes roughened and even the anterior portion may become similarly changed. The tissue about the roots of the lashes is swollen and the hair follicles become wider, exposing the roots. The secretion of the sebaceous glands becomes more liquid. When this form of blepharitis is well-marked, the tarsus-conjunctiva is mostly already cicatricial and thickened in its upper two-thirds. In the lower third there are then generally found many follicles just above the margin of the lid. In some severe cases the follicles may extend over to the lid margin and breaking down give rise to ulcers. At the time when the thickening of the lid margin is pronounced, the tarsus may already be softened or diminished in size by atrophy. The consecutive progressive atrophy of the tarsus which has been thickened is often found following soft degeneration of the conjunctiva. In rare cases, however, the tarsus may become enormously thickened from amyloid or hyaline degeneration.

The relation of the affection of the Meibomian glands and the lid margin to the various phases of the disease of the conjunctiva are quite well shown in the following table.

EXAMINATION OF 657 TRACHOMATOUS EYELIDS.

	Location of the follicles in the			Scars	
	fornix	tarsal conjunctiva	fornix and tarsus. Ulceration soft infiltration	Small scars of tarsal conjunctiva	Deep flat scars. Scars of tarsal conjunctiva
Number of lids examined.....	60	61	25	260	251
Lid margin: swollen, irregular, etc.....	7%	12%	44%	38%	91%
Anterior angle and region of lashes: thickened and irregular.....	3″	8″	48″	40″	91″
Intermarginal space: hyperæmic, rough, cleft, etc.....	0″	0″	0″	2″	70″
Intermarginal space: covered with foamy secretion..	12″	44″	52″	31″	53″
Meibomian glands: ducts altered, secretion abnormal...	8″	28″	56″	55″	85″
Posterior angle: thickened, cleft, etc.....	5″	11″	20″	24″	43″
Follicles on posterior portion of lid margin.....	0″	6″	6″	4″	8″
Trichiasis.....	0″	0″	8″	7″	25″
Madarosis.....	0″	0″	0″	7″	27″
Tarsus thickened.....	0″	0″	6″	32″	84″
" softened.....	1″	3″	31″	18″	34″
" curved.....	0″	0″	10″	5″	50″
" shrunken.....	0″	0″	0″	0″	34″

The same results in regard to the proportional participation of the lid margin and tarsus in trachoma are shown also by microscopic examination. Thus even in the beginning the disease is not limited to the palpebral conjunctiva, as is generally believed, but passes regularly to the submucous tissue—that is, when the follicles are grouped together the small-celled infiltration of the region regularly passes into the depth of the tarsus and extends the more deeply the more follicles there are present, often down to the acini of the Meibomian glands. A point of predilection for the small-celled invasion is about the middle of the tarsus, where its large vessels communicate with those of the conjunctiva. Among these vessels the round cells are mostly grouped into nests and form at times globular masses of follicle-like structure. In more advanced cases of severe trachoma, when the follicles in the tarsal conjunctiva are thrown off and fresh scars appear, one finds in the interior of the tarsus, frequently, typical follicles of different sizes. They mostly break down and cicatrize, thus destroying the acini of the Meibomian glands over a considerable area. With the further progress of the conjunctival processes there is diffuse infiltration of the tarsus with round cells and often follicle formation. At times these follicles break through into the interior of the Meibomian glands; in rare cases there may be in the lower lid a perforation of the outer skin by the infiltrated tissue. Frequently the upper portions of the acini are cut off by the follicular process from the lower. The acini thus cut off become cystic with various sorts of contents, or still communicating with the main ducts their contents pass to the lid margin or the conjunctival sac.

In some cases the cystoid cavities lack any epithelial lining and are apparently empty. When the glands are already destroyed in the upper portion of the tarsus, remains of them may be found at the lid margin.

When the changes in the lid margin and tarsus are so far advanced, the dense conjunctival scar, as a rule, has already caused a considerable curving of the tarsus. This termination in entropium is the most frequent one in the course of trachoma, but not the only one. Frequently, in severe trachoma, notwithstanding the intense involvement of the tarsus, the entropium does not develop. The tarsus atrophies, the Meibomian glands disappear, and still the lid retains its normal position, and there is no entropium. In such cases the tarsitis accompanying the con-

junctival affection causes a shrinking of the tarsal tissue synchronously and proportionately with the conjunctival cicatrization. The severer forms of tarsitis with soft infiltration of the conjunctiva lead in the end rather to atrophy and diminution of the tissues of the lid than to entropium. The greatest curving of the tarsus occurs when the middle of its surface is invaded by the follicular process and softened. When in sagittal sections of trachomatous lids a marked bending of the tarsus is found, at the angle either typical follicles as foci of softening are present, or, in their place, the dense scars they have left behind them.

With atrophy of the tissue of the tarsus there are usually also atrophic changes in the conjunctival scar. The same processes take place in both. In both one finds sclerotic, thickened fibrous tissue, the bundles running mostly in a sagittal direction, with many spindle cells among them.

In the end stages of severe trachoma there is found later, in place of the formerly cicatricial sclerotic connective tissue, a fine reticular tissue with large elongated cells at the nodal points. In such cases the scar tissue in the tarsus and conjunctiva has undergone a fatty metamorphosis and broken down leaving only the fine reticulum. The latter manifestations of the trachomatous process are found in the tissue of the lid margin when the conjunctival affection has almost run its course. Here, when the conjunctiva is wholly cicatricial and the tarsus shrunken, one frequently finds still typical follicles in the lowest parts of the tarsus-conjunctiva close above the inner angle of the lid margin. Sometimes one finds follicles in the tissue of the lid margin also, within the greatly infiltrated margin.

Moll's glands in the lid margin undergo changes similar to those in the Meibomian glands, becoming distended and filled with altered secretion. A peculiar change is found in the accessory lachrymal glands after trachoma has run its course. They are often greatly developed and sunken lower down toward the margin of the lid in cases in which the Meibomian glands are completely atrophied. This hypertrophy is perhaps for the purpose of compensating for the diminution of the normal secreting surface caused by trachoma.

Judging from the size relations of these glands one must conclude that the conjunctiva can well be kept moistened by them even after all the other secretory organs are atrophic. This explains the well-known but surprising fact that xerotic drying of

the conjunctiva does not always correspond to the changes in the conjunctiva in trachoma, but that it appears early in some cases while the conjunctiva is not yet cicatricial, and in other cases is wanting notwithstanding complete cicatrization of the conjunctiva. It is worth while in cases of xerosis of the conjunctiva to take into account the condition of these glands.

The foregoing represents the course of the affection of the tarsus and lid margin as seen in severe cases of trachoma.

3. BACH (Marburg). **The centres of pupillary reaction.**

Bach reports on experiments carried out jointly with Hans Meyer on cats that had been tracheotomized and on which artificial respiration was performed. The chief purpose was to find what influence a division of the cervical cord and medulla has upon the light reaction of the pupil.

The results may be stated briefly as follows. Section of the cervical cord has no effect upon the light reaction of the pupil. Section at a particular spot near the spinal end of the floor of the fourth ventricle, immediately cuts off the light reaction. Unilateral section at this point causes reflex iridoplegia of the opposite side. Mild mechanical or other excitation at this point caused myosis and reflex iridoplegia. This myosis and reflex iridoplegia can at once be relieved by section above the spinal end of the floor of the fourth ventricle and reaction then becomes prompt.

The results of the experiments are best explained by supposing a regulating influence on the pupil by the spinal end of the floor of the fourth ventricle, in the sense of a reflex-inhibitory centre.

Injections of nicotine into the orbit of the cat causes paralysis of the sphincter pupillæ in a few seconds, and of the sphincter in the other eye a few seconds later. This indicates the presence of sympathetic nerve cells in the orbit, and speaks in favor of the sympathetic nature of the ciliary ganglion without denying the possibility of its being of mixed nature.

Investigations in regard to the oculomotor nucleus in men who had lost one eye, or in whom one eye had been phthisical for years, failed to confirm Bernheimer's findings with reference to the Edinger-Westphal nucleus after evisceration of the eyeball, and his views of the physiological function of this nucleus.

4. PETERS (Rostock). **On changes in the epithelium of the ciliary body in napthalin and ergotin poisoning.**

The author reports on experiments for the further study of the

ciliary epithelium in various forms of artificial cataract. After a single administration of napthalin, vesicles were found in the region of the pigment epithelium of the ciliary processes as well as in the retina, such as are found after puncture of the anterior chamber. The pigment epithelium is in part destroyed and thrown up into vesicles. The cuboidal epithelium exhibits numerous vacuoles, and on the surface of the ciliary processes there is a deposition of albuminous secretion. Thus, anatomically, one finds an increase in the normal secretion and the appearance of an abnormal secretion when the cataractous changes consist only in slight plaiting of the capsule at the equator of the lens.

After ligation of the venæ vorticosæ, the conspicuous symptom is the excessive hemorrhage, but very early changes in the ciliary epithelium similar to those described may be found, while the chief cause of the fibrinous exudation is to be sought in a directly mechanical lesion of the tissue from the excessive hemorrhage.

Furthermore, the author experimented with ergotin in the attempt to produce cataract. Although the early death of the animal prevented the observation of the development of cataract, yet after the subcutaneous use of ergotin characteristic changes were found in the ciliary epithelium, so that one may assume that this poison has a rapid and specific effect upon the ciliary epithelium, and that the latter under this influence secretes an aqueous humor in which the relative amounts of normal components are altered—the action of which upon the lens has been described in detail in an earlier paper.

Discussion.—Vossius spoke of cataract in young women with struma. This is a sort of nuclear cataract and Vossius believes that it also is dependent upon toxic influences.

Schmidt-Rimpler had observed an ergotin epidemic in Marburg. He believed that such forms of cataract were rather caused by general spasms.

Uhthoff, Pflueger, and Sattler denied any connection between struma and cataract.

5. Elschnig (Vienna). **On histological artefacts of the optic nerve.**

Siegrist, at the previous Heidelberg meeting, reported on a new degeneration of the optic nerve designated "degeneration in patches." Fuchs and Wagenmann stated in the discussion that they regarded these as post-mortem changes or the effects

of hardening. Elschnig has long recognized these changes as the results of compression and recently, together with Dr. Goldberg, he had proven experimentally that the changes were such in fact. By compression, in chiselling the nerve from the optic foramen, or in severing the nerve with scissors, particular bundles of the optic nerve were emptied of their contents and the soft nerve masses were forced into adjacent parts of the nerve, escaping from the bundles and perhaps passing through septa into neighboring bundles whereby all the manifold changes described by Siegrist were produced.

6. E. VON HIPPEL (Heidelberg). **On the origin of typical congenital coloboma of the eyeball.**

A male rabbit with coloboma at the optic-nerve entrance transmitted the malformation to 20 % of his progeny. The fœtuses were examined, in all 112 ocular vesicles presenting 23 colobomas.

Ætiologically one could exclude: 1. An inflammatory process. 2. An injury of the cells of the ocular vesicle from toxins of any sort. 3. The effect of pressure of the amnion. 4. A primary developmental anomaly of the brain. The only authenticated ætiological factor was the hereditary on the male side. The question whether a coloboma is to exist is determined when the spermatozoön unites with the ovum. Coloboma is purely a checked development.

Discussion.—WAGENMANN knew a woman with coloboma whose children all had coloboma although they were the offspring of three fathers.

BAHN also presented the history of a family with coloboma.

7. WAGENMANN (Jena). **On anæsthesia by chloride of æthel.**

Wagenmann obtained anæsthesia for small operations about the eye, particularly in the region of the lids, brows, and tear sac, by freezing with æthel chloride, while the ball was protected with a guttapercha plate and a pledget of gauze over the palpebral aperture. Experiments on rabbits had shown that æthel chloride did no harm even when it entered the conjunctival sac, but freezing of the surface of the eye must under all circumstances be prevented. It is sprayed on through a particular nozzle (Hertel), and no bad effects have been observed from its use in a great number of cases. If pain is felt in the depth of the wound, cocaine is dropped in.

Discussion.—SCHMIDT-RIMPLER stated that the deeper parts do not lose their sensibility.

FRANKE and AUGSTEIN prefer to use the Schleich solution.

8. PFLUEGER (Berne). **General narcosis in the Berne eye clinic.**

Pflueger has given up ether and uses chloroform for narcosis. He had had an apparatus constructed which properly mixed chloroform and air and reduced the use of chloroform to a minimum.

NIEDEN recommended for general narcosis subcutaneous injections of scopolamin such as are now used in the Bonn surgical clinic.

9. FUCHS (Vienna). **Scleritis posterior.**

In a boy of sixteen, pain appeared first in the right and two months later in the left eye and soon after disturbance of vision. In the fundus there was, besides hyperæmia of the disc, a steel-gray opacity of the retina in the macular region, with protrusion forward of the retina, recognizable by the fact that the refraction here was hyperopic. The conjunctiva and the episcleral tissue were reddened and swollen near the outer canthus. The opacity of the retina and the disturbance of vision disappeared in a week. The opacity and protrusion of the retina could not be referred to an inflammation of this membrane or of the choroid because of the relatively slight disturbance of vision and their rapid disappearance without leaving permanent changes. The pain would indicate an inflammation of the sclera. Fuchs assumed the existence of a scleritic focus in the posterior part of the sclera with opacity and swelling of the overlying choroid and retina.

Discussion.—SCHLÖSSER reported a similar case which had become clear to him since hearing Fuchs's paper.

10. STOCK (Freiburg i. Br.). **Experimental contributions to the localization of endogenous injuries of the eye.**

Stock, unlike Gasparrini, Bellarminoff, and others, had been unable, by injecting the toxins of the diphtheria bacillus, the staph. pyog. aureus, and the bacterium coli into the vitreous of one eye, to cause an inflammation in the other.

After injecting cultures of pyocyaneus β into the ear veins of rabbits, however, he frequently obtained inflammation of the eyes. The metastases appeared exclusively as bacterial emboli on the anterior surface of the iris (nodular iritis). In one animal an extensive choroiditis was observed.

The author comes to the following conclusions :

1. In general blood infection in rabbits, metastases frequently appear in the iris. Their frequency increases with the severity of the infection.

2. This nodular iritis may be recovered from.

3. The author is unable to say definitely whether the irritation has any influence upon the formation of metastases.

Of thirteen animals into whose blood current tubercle bacilli were introduced, thirteen times an iritis tuberculosa and choroiditis disseminata appeared, one animal recovering,— a definite proof that a tuberculous iritis and choroiditis may be recovered from.

Discussion.—UHTHOFF had seen a large choroidal tubercle disappear. He also regarded tuberculous meningitis as curable.

RÖMER called attention to the susceptibility of the eye to metastases. He believed that the development of sympathetic ophthalmia could best be explained in this way.

AXENFELD remarked that Stock obtained experimental metastases so often because he made intravenous injections. This occurred much less frequently when subcutaneous injections were employed.

SECOND SESSION, AUGUST 4TH. DR. SCHIRMER (GREIFSWALD) PRESIDING.

Demonstrations.— RÖMER, RAEHLMANN, ELSCHNIG, and v. HIPPEL demonstrated preparations illustrating their papers.

1. AXENFELD (Freiburg). *a.* **On the pathological anatomy of fracture of the orbit.**

At the autopsy on a man of sixty who had suffered a severe blow many years before there was found protruding toward the brain through a perforation in the roof of the orbit as large as a quarter, a mass which proved to be a hernia orbito-cerebralis following a perforating fracture of the roof of the orbit and rupture of the dura. It was covered by an organized dural hematoma. The fact that the brain did not protrude into the orbit, as would naturally be expected, was probably due to the fact that hemorrhage into the orbit increased the tension here beyond the intracranial tension and later the organized hematoma prevented the prolapse of brain tissue. (A more detailed account may be found in v. Schuster's *Inaug. Dissert.*)

b. **On the new formation of glassy membranes in the eye (vitrification of the iris).**

In an eye with absolute glaucoma there was found microscopically a very peculiar configuration of the iris, caused by the fact that the entire iris on both anterior and posterior surfaces back to the ciliary body was covered with a vitreous membrane resembling Descemet's membrane, which appeared to compress the iris tissue greatly. The thicker pupillary portion with the sphincter together with the thinner remainder of the iris had, in sections, the form of a drumstick. Low degrees of this vitrification of the iris proceeding from the endothelium of the chamber angle are not rare in glaucoma (Wagenmann, Michel).

c. **Fibrin-like masses in a luxated calcareous cataract.**

2. WAGENMANN (Jena). **On the pathological anatomy of rupture of the choroid and iridodialysis.**

Only the inner layers of the choroid were torn ; the rupture of the choroid began at the point where a ciliary artery passed in. In the course of the entire rupture the edges were united by a delicate cicatricial tissue. The iridodialysis corresponded to a rupture of the zonula, and the equator of the lens was here more convex. From the scar in the iris a layer of endothelium passed to the lens, resting on the vitreous, which protruded through the rupture in the zonula.

3. UHTHOFF (Breslau). **Microscopical preparations of diphtheria of the human conjunctiva.**

4. THIER (Aix). **Demonstration of an orbital tumor.** Large osteoma in a girl of twenty.

5. DIMMER (Graz). **Demonstration of photogrammes of the fundus.**

Dimmer has now obtained much better results than he showed at the meeting in 1901. By improving his apparatus he has succeeded in taking actual instantaneous photographs. The pictures are 30 *mm* in diameter, but will stand a double or triple enlargement. As in the earlier photographs, a fundus field of 5–6 p. d. is obtained, but now it is sharper in detail. The perfected apparatus is now being made by Zeiss, and it will be so constructed that it may be used even by one who has not a special knowledge of its principles.

6. HEINE (Breslau). **Demonstration of stereoscopic photogrammes.**

7. GULLSTRAND (Upsala). **Demonstration of an instrument for completing the ray formations about luminous points.**

8. PFLUEGER (Berne). **Demonstration of a protected Stilling harpoon for the purpose of operating in the anterior chamber without the escape of the aqueous humor.**

Discussion.—LEVINSOHN (Berlin) recommended a sort of de Wecker scissors with which one could work in the anterior chamber without the escape of aqueous.

9. STOEWER (Witten). **An instrument for extracting the lens in its capsule.**

The instrument consists of a spoon which is laid over the anterior surface of the lens. The neck of the spoon is hollow and continuous with the cavity of the bowl. At its free end a rubber balloon is fastened. After making a large corneal flap and a broad iridectomy, the balloon is compressed and the bowl of the spoon passed over the anterior surface of the lens. The balloon is then released and the suction holds the lens fast in the spoon and it is drawn forward into the anterior chamber. The few experiments yet made naturally allow no definite conclusions as to the practical value of the instrument.

10. v. PFLUGK (Dresden). **A phantom for ophthalmoscopic practice.**

Two eyes are fastened upon a stative similar to the black phantoms used for operations. By a simple mechanism exophthalmus and enophthalmus can be produced. The cornea has a curvature of 8 *mm* radius. The pupil can be altered from 2–10 *mm* by introducing different diaphragms. The lens has a refractive power of 66 D. The distance from the posterior pole of the lens to the location of the retinal image is 15 *mm*. The curved fundus, colored in its normal colors, rests in a sliding cylinder with a scale which indicates the refractive condition in dioptries. The phantom is adapted for the direct and indirect methods of examination, and for skiascopy.

Manufactured by P. Doerfel, Berlin, N. W. T., Unter den Linden 44. Price 65 marks.

11. HERZOG (Berlin). **On the development of the intrinsic muscles of the eye.**

The author states that the sphincter and dilator pupillæ are of epithelial origin, while the ciliary muscle arises from the mesoderm. Numerous preparations were demonstrated.

THIRD SESSION, AUGUST 5TH, MORNING. DR. GULLSTRAND (UPSALA) PRESIDING.

1. VOLKMANN (Berlin). **Conclusions as to practice from the theory of eye magnets.**

The author distinguishes attraction and traction magnets. For the former the weight of the splinter of iron is of no importance, but its form is of great importance. These strong magnets must be used with great care.

With the traction or sound magnets the form of the splinter is of little importance, but its diameter is of great importance.

Discussion.—HAAB, in the course of ten years, had used his giant magnet on about 170 cases. Among 165 of which records had been kept the extraction was accomplished in 141 cases, or 86 %. He now almost never uses the small magnet. In 51 cases good vision was obtained.

SCHREIBER (Magdeburg) was the first to use Volkmann's magnet in practice; in four cases with excellent results.

2. FRANKE (Hamburg). **On the diagnosis and treatment of retrobulbar diseases.**

Franke demonstrated five skiagraphs of retrobulbar tumors, and discussed the indications for Krönlein's operation.

Discussion. — SCHMIDT-RIMPLER recommended his sound method for diagnosing retrobulbar tumors.

3. KRÜCKMANN (Leipsic). **Iridocyclitis syphilitica.**

The syphilitic changes run in the eye a course clinically analogous to those of the skin and mucous membranes.

Krückmann divides the secondary stage in the iris and ciliary body into the erythematous, the papular, and the tuberous. He describes fibrinous iritis as a roseola, and classes it with the primary erythematous angina. He distinguishes early and late forms of papules, and shows on anatomical grounds why these efflorescences always present themselves in the pupillary region and have a round shape. The signs of tuberous syphilides, which distinguish them from gummata, are discussed. The histological changes are discussed, and he concludes with a detailed clinical description of the various sorts of gumma.

4. AXENFELD and NAÏTO. **Nerve loops in the sclera.**

Axenfeld described at the Heidelberg Congress, in 1893, a nerve that passes transversely through the sclera close behind the ciliary body. It had twice the thickness of an ordinary

ciliary nerve, and divided in the suprachoroidal space into an anterior and a smaller recurrent portion.

The study of serial sections has shown the writers that such nerves are ciliary nerves, which pass through the sclera, run on its outer surface, and then pass back through the sclera and give off branches, some of which run to the ciliary body. There nerves are found frequently, but not constantly. As a rule, only one nerve of this sort is found in the eye. The development and physiological significance of this loop are hard to understand. Such a nerve gives one the impression of being too long for the eye, and the loop would seem to be a means of fixation which allowed a lateral distribution farther forward.

5. SCHIRMER (Greifswald). **On lachrymal secretion and the carrying off of the tears after extirpation of the sac.**

After extirpation of the sac the lachrymation decreases. This does not depend, as Tscherno-Schwartz believes, upon an atrophy of the lachrymal gland. The normal lachrymal gland secretes so little liquid that it can hardly be taken into consideration—perhaps a drop every two hours.

Discussion.—AXENFELD stated that the incision for extirpation of the sac should not be made too near the lids, because epiphora would then be likely to result.

SIMON (Berne) recommends the filling of the sac with paraffin before extirpation.

GREEFF believes that the conjunctiva keeps itself moist, and that the lachrymal gland normally is not active and secretes only in conditions of excitation or reflex processes. The conjunctiva itself is a flat gland, the lachrymal gland an irrigating apparatus which is not constantly active.

WAGENMANN expressed himself in a similar manner.

6. WOLFF (Berlin). **On the theory of skiascopy, the determination of refraction by skiascopy, and on his electric skiascopophthalmometer, with remarks on the line of accommodation and the spherical aberration of the eye.**

7. GULLSTRAND (Upsala). **Remarks on the color of the macula.**

Gullstrand explains the yellow color of the macula as a post-mortem change. He examined freshly enucleated eyes which had been put into physiological salt solution. After some minutes the retina separated from the pigment epithelium and could readily be detached. The fresh retina then appeared colorless in the centre.

Discussion.—SCHMIDT-RIMPLER believed that in this experiment the coloring matter was dissolved out.

SATTLER also found with Hering the yellow coloring matter clearly visible.

8. GREEFF (Berlin). **On a fovea externa in the human retina.**

The methods of fixation and hardening of anatomical preparations generally used do not all permit us to obtain a retina in its exact position; and this is particularly true of the thinnest portion of the retina, the fovea. Here the retina is always folded or arched and detached. We have therefore no convincing representation of the actual configuration of the macula lutea and fovea centralis. Greeff concludes, after measuring the length of the rods and cones in all portions of the retina, that there must be a shallow depression in the external surface of the retina at the macula which he calls a fovea externa. Schultze described a slight bulging forward of the limitans externa at the macula, but this statement was later forgotten or even denied. Kuhnt and Dimmer did not regard it as true.

The longest rods measure 60 μ. The cones increase in length from the periphery of the retina, where they are 22 μ long toward the centre, being at the margin of the fovea 60–62 μ long. Here where the rods begin to disappear the cones have attained the length of the rods. Up to this point the ends form a straight line, but in the fovea the cones grow to be 85 μ long—*i. e.*, 25 μ longer than the longest rods. Since the line of the choroid and pigment epithelium remains straight, room must be provided for these long cones by an arching forward of the limitans externa of at least 25 μ.

The retina, which is 300 μ thick, thins down in the fovea to 100 μ, thus losing 200 μ of its thickness. The outer surface loses 25 μ and the inner 175 μ. We must thus accept the belief in a fovea externa but a flat one only one eighth as deep as the fovea interna.

SESSION FOR DEMONSTRATIONS. DR. FRANKE (HAMBURG) PRESIDING.

1. HEINE (Breslau). **On rupture of the lamina vitrea in the myopic eye.**

Heine, as he has previously stated (*Arch. f. Augenh.*, xxxviii., p. 288), believes that one will seek in vain for actual inflammatory

changes in myopic eyes. He explains the myopic foci as injuries of the choroid and retina caused by mechanical traction. The lamina vitrea exhibits dehiscences of various sizes, of which the smallest are theoretically of the greatest interest, since they exhibit no further complications than the slightest affections of the pigment epithelium. Apparently we have here the primary condition before us.

Secondarily reactive or regenerative proliferations of the pigment epithelium, and also of the choroid, take place, which may lead to hypertrophic scars and membranes.

There were demonstrations of preparations, photomicrographs, and drawings.

2. GRUNERT (Tübingen). **On retinitis septica and metastatica.**

Grunert reported a case of kryptogenetic septico-pyemia with ocular complications. Two weeks before death a subacute, purulent metastatic ophthalmia developed in the right eye, with an exudation in the pupil and hypotony. Two days before death there appeared in the retina of the other eye hemorrhages and white spots, presenting the picture of so-called retinitis septica.

The anatomical findings in the right eye consisted in a purulent iridocyclitis and infiltration of the vitreous and purulent retinitis of high degree. The condition in the other eye was surprising. Instead of degenerative changes in the nerve-fibre layer, described by Roth, Herrnheiser, and others, there were here dense round-celled infiltrations, arising from the retinal vessels, which had broken through the outer layers of the retina, without, however, involving the choroid in the inflammation. Corresponding to the ophthalmoscopic picture of round hemorrhages with a white centre, the retinal infiltrations were surrounded with ring-shaped hemorrhages. The optic nerve in its retrobulbar portion exhibited numerous abscesses, mostly along the central vessels.

The case proves that the ophthalmoscopically visible retinal changes in sepsis, the so-called septic retinitis of Roth, is not produced alone by degenerative processes of toxic origin, as perhaps the retinitis in pernicious anæmia, leucæmia, diabetes, and the like, but also by metastatic inflammatory processes.

STOCK exhibited anatomical preparations of heredito-specific parenchymatous keratitis, which were particularly interesting as revealing an internal ulcer of the cornea that had run its course.

3. BEST (Giessen). **Preparations showing plasma cells in ribband-shaped keratitis.**

4. DE LIETO VOLARO (Naples). **The pathological anatomy of gerontoxon.**

Volaro, like Takayasu, used sudan III for staining the gerontoxon. He found a fatty infiltration not only in the lamellæ but also in the interstices.

5. MAGEDA (Giessen). **Carcinoma of the lid with mucoid degeneration.**

6. HESS (Wurzburg). **Comparative anatomical investigations on the pigment epithelium.**

He found in the cephalopods a well-marked wandering of the epithelium after illumination, so that the retina became quite black.

7. HAMBURGER. **Experiments illustrating his paper** (abstract farther on).

8. DIMMER. **Photographs of the fovea centralis hardened in bichloride.**

9. LEBER exhibited an apparatus for transillumination of the sclera in order to determine the presence of intraocular tumors.

10. WINTERSTEINER (Vienna). **On secondary changes in circumbulbar atheromatous cysts.**

The degeneration of the walls in atheromatous and dermoid cysts consists in casting-off of the epithelium, tearing of the walls, and the granulating of the defects; rarely such metamorphoses transform the cyst into a solid tumor.

WEDNESDAY, AUGUST 6TH, MORNING SESSION. DR. VOSSIUS (GIESSEN) PRESIDING.

1. BIELSCHOWSKY (Leipsic). **The innervation of the internal recti as producers of latero-version.**

The idea that the associated lateral movements depend upon a common origin of the nerve fibres for one external rectus and the associated external rectus in the nucleus for the external rectus, can no longer be held. Bielschowsky reports a case of injury of the occiput followed by paralysis of both interni in their function as producers of lateral movements but not in their function as convergers. Both external recti retained their normal function, but at first there was a paralysis of the elevators of the eyeballs; restitutio ad integrum. The writer believes that the cause consisted in hemorrhages in the gray matter about the aqueduct of Sylvius.

2. LIEBRECHT (Hamburg). **Pathological changes in the optic nerves in cases of brain tumor and the pathogenesis of choked disc.**

Liebrecht comes to the following conclusions:

1. Choked disc and inflammation of the optic nerves in cases of brain tumor are two distinct things. Choked disc arises from lymph stasis in the nerve, and as such shows no evidences of inflammation.

2. Choked disc may appear before or after inflammation of the nerve.

3. The lymph stasis in the nerve is not of inflammatory origin, but is caused probably by compression of the veins and lymph vessels.

Discussion.—LEBER remarked that cavities arising during hardening of the tissues might simulate œdema. Furthermore, œdema may arise from inflammation as well as from stasis.

SCHMIDT-RIMPLER adhered to the Schmidt-Manz theory.

LEVINSOHN objected to the stasis theory since in cases of choked disc lumbar puncture revealed no increased tension in the escaping liquid.

AXENFELD said, on the contrary, that intraspinal tension was not always an indication of intracranial tension.

3. BEST (Giessen). **On congenital chorioretinitis.**

Best discussed the fundus condition characterized by fine light stippling and also spots of pigmentation. He regards these cases as not being due invariably to hereditary syphilis. Among nine cases seen in the Giessen clinic there was hereditary syphilis in none. Possibly these cases belong rather in the category of retinitis pigmentosa.

4. UHTHOFF (Breslau). **A contribution to the knowledge of visual disturbances in brain injuries, with remarks on functional disturbances in brain diseases.**

Uhthoff observed for a year and a half a patient with a severe injury of the skull in the left occipital region, brain abscess, and a fatal outcome.

Besides other symptoms, he found right homonymous hemianopsia and functional concentric narrowing of the remaining left halves of the fields; right-sided sensory hemianæsthesia with involvement of the other right sense organs. Such symptoms could be voluntarily produced by moderate compression of the injured spot in the skull. Furthermore, at command a peculiar transient

disturbance appeared in the voluntary movement of the eye to the right, while when a fixated object was moved to the right the ball turned readily.

Later bilateral choked disc appeared with the development of the abscess and disappeared after this was evacuated by operative means.

5. Vossius (Giessen). **Two rare cases of orbital affection.**

a. Necrosis of the bulbar conjunctiva after injury with streptococcus injection and subsequent gangrene of the lid.

b. Actinomycosis of the outer orbital wall and cavernous sinus.

6. Baenziger and Silberschmidt (Zurich). **On the etiology of panophthalmitis after injuries in the harvest field.**

In an incipient panophthalmitis twenty-eight hours after an injury, the authors found only a single bacillus, which belonged to the group of hay bacilli. Pure cultures injected into the eyes of rabbits produced abscess of the vitreous. These hay bacilli often live in the earth, and the authors were able to produce panophthalmitis by inoculating animals with fresh earth from the field in question, and from the eye to cultivate the hay bacillus.

These investigations recalled those of Paplawska and Haab.

Discussion.—Schmidt-Rimpler had seen tetanus follow injury with a foreign body coming from the soil.

Sattler had produced panophthalmitis with the saprophytic prodigiosus.

Axenfeld called attention to the paper by Fromaget on tetanus after ocular injury.

7. Wolff (Berlin). **On bilateral pathological light reflex at the macula (retinitis serosa centralis, observation with his electric ophthalmoscope), a new diagnostic sign of Bright's disease.**

The author has observed, after excitation of the centre of the retina by light and also in general diseases, changes in the light reflex at the macula which he attributes to an œdema at this place (retinitis serosa centralis).

8. Levinsohn (Berlin). **On the condition of the pupil after resection of the cervical sympathetic or removal of the superior ganglion.**

Levinsohn's experiments on animals showed that the greater effect produced by removal of the ganglion than by section of the sympathetic is due to a tonus remaining in the ganglion, which is

dependent upon higher cerebro-spinal connecting twigs. The re-enlargement of the pupil is principally to be attributed to a sphincter paresis. The dilatator tonus is permanently reduced as well by section of the sympathetic as by extirpation of the ganglion.

In many animals, however, it seems to have an increased excitability in the way it is acted upon by certain poisons.

9. GUTTMANN (Berlin). **On experiences with Angelucci's modification of simple cataract extraction and its employment in other operations.**

In performing simple extraction one seizes the expansion of the tendon of the superior rectus with a broad forceps without a catch. The free portion of the forceps at the same time retracts the upper lid from the ball. The operation can thus be done without assistance, and even a speculum is superfluous.

10. HAMBURGER (Berlin). **On the question as to the origin of the aqueous humor.**

Hamburger opposes the view that the pupil is freely pervious. Fluorescin in small quantities introduced into the eye shows the direction of the current.

Discussion.—LEBER regarded the method of proof as not convincing.

11. AUGSTEIN (Bromberg). **On perceptible movement of the blood in new-formed corneal vessels and its significance.**

The author has observed the movement of the blood in corneal vessels only when they were beginning to degenerate. Gradually the blood current is interrupted, and finally the vessels become empty. Possibly this sign may have some prognostic value.

Discussion.—GRUNERT has often seen circulation in corneal vessels. It is more evident under atrabilia.

LEBER stated that in the development of such vessels there was a stage in which the circulation ceased, namely, before the ends of the new vessels became united.

REPORT OF THE OPHTHALMOLOGICAL SOCIETY OF THE UNITED KINGDOM.

By Mr. C. DEVEREUX MARSHALL.

FRIDAY, NOVEMBER 14, 1902. A. STANFORD MORTON, F.R.C.S., VICE-PRESIDENT, IN THE CHAIR.

Avulsion of the eyeball with midwifery forceps.

Mr. Simeon Snell (Sheffield) related this case. The child was admitted on the day following its birth with the left eyeball lying on the cheek, being connected to the orbit merely by bands of conjunctiva. The mother had a very contracted pelvis and delivery was effected with the greatest difficulty with forceps which had caused the injury to the eye. The globe was removed with fully an inch of optic nerve attached to it.

Paralysis of the upward movements of the eyeball.

Mr. Snell related this case. The patient was a man aged fifty who after being at work all day came home to tea, fell asleep, and remembered nothing more till four the next morning. His wife called him three times during the night but he had no recollection of it. When he awoke he had severe pain in the forehead and diplopia. Three days later the movements of the eyeball were normal except upwards. On attempting to do this the lids were raised but the eyeballs did not move and he could not follow a moving object upwards. The vision in both eyes was normal. The diplopia disappeared two days later and a month later the movements of the eyeballs had returned perfectly.

Retinitis pigmentosa occurring in five generations.

Mr. Snell mentioned the case of a man aged forty-six who since childhood had found great difficulty in going about at night time. The sight now was only $\frac{2}{60}$ in the right and $\frac{1}{60}$ in the left.

The ophthalmoscope showed a typical case of retinitis pigmentosa. The family history was remarkable. The first known to be affected was his great-grandfather. His only daughter was affected and from him sixty-nine individuals had been descended. Of these twenty-eight had night blindness. The patient's father had eleven children of whom five were affected: the patient himself had eleven children of whom seven were affected, viz: five boys and two girls. There was no evidence of consanguinity. No generation was skipped and it affected equally the males and females. Night blindness showed itself in early childhood and at about the age of forty some more and some less of the affected ones had become practically blind.

The following card specimens were shown:

Mr. JESSOP: A case of sympathetic ophthalmitis with cysts of iris. Mr. ROLL: A case of congenital ophthalmoplegia. Mr. N. B. HARMAN: Two cases of fissura facialis. Mr. MACCALLAN: Case of lymphangiectasis of the conjunctiva. Mr. GRIMSDALE: Paralysis of both external recti. Mr. ARNOLD LAWSON: Paralysis of the sympathetic.

On the necessity for the use of color names in a test for color blindness. By F. W. EDRIDGE-GREEN, M.D., F.R.C.S.

The first requirement of a test for color blindness is that color names be used and that the person to be examined should employ and understand the use of the color names—red, yellow, green, and blue. I can say in the most emphatic manner that no test which ignores color names can be efficient. I predicted that if color names were ignored in the Board of Trade tests normal-sighted persons would be rejected, and this prediction was fulfilled. Over 38% one year and more than 42% another year were found to be normal-sighted and to have been rejected wrongly. An engine driver or sailor has to name a colored light when he sees it, not to match it. He has to say to himself, "This is a red light, therefore there is danger," and this is practically the same as if he had made the observation out loud. Even the method of matching colors should, in order to be efficient, be one of mentally naming them. In my Classification Test I use colored materials of different kinds, as similarity, other than that defined by the word "color," is the great source of error in a test of this kind. The color blind may be divided into two distinct classes, which are independent of each other, but which may be associated. The first class includes those who are not able to see certain rays of the

spectrum; their spectrum is shortened at one or both ends. If a man have shortening of the red end of the spectrum, he will not be able to see a red light at a distance though he might be able to pick out all the green wools in the Classification Test. A man of this kind when shown the red light of my Lantern Test declares that there is no light visible, at once demonstrating his incapacity. The second class of the color blind make mistakes not because they can not perceive a certain color, but because they are not able to recognize the difference between the colors which is evident to normal-sighted persons. Both these classes are represented by analogous conditions in the perception of sounds. The first class of the color blind is represented by those who are unable to hear very high or very low notes—that is to say, these notes are non-existent to them. The second class is represented by those who possess what is commonly called a defective musical ear. Normal-sighted persons see six definite colors (points of difference) in the spectrum. The second class of the color blind see five, four, three, two, or one color, according to the degree of the defect; and they confuse the colors of the normal-sighted which are included in one of their own. If the normal-sighted be designated hexachromic, those who see five colors may be called pentachromic, those who see four, tetrachromic, those who see three, trichromic, those who see two, dichromic, and the totally color blind, monochromic. The degree of the defect will be recognized by the names given to different colors. The pentachromic will miscall orange. The tetrachromic will in addition make mistakes with regard to blue. It is not necessary to reject either of these two varieties, because I have never succeeded in making them confuse the colors, red, yellow, green, and violet. The trichromic are always in difficulty over yellow and miscall it red, green, or red-green, and for practical purposes must be excluded as color blind. The dichromic confuse red, orange, yellow, and yellow-green on the one hand, blue-green, blue, and violet on the other.

REPORT OF THE MEETINGS OF THE OPHTHALMOLOGICAL SECTION OF THE NEW YORK ACADEMY OF MEDICINE, HELD ON MONDAY EVENINGS, OCTOBER 20, AND NOVEMBER 17, 1902.

By Dr. HENRY H. TYSON, Secretary.

MEETING OF OCTOBER 20th.

PRES. DR. JOHN E. WEEKS IN THE CHAIR.

Dr. Skeel presented a **case of linear extraction of soft cataract.** Patient was a young woman with a traumatic cataract. Vision $\frac{5}{200}$ when operated upon. Extraction performed under ether anæsthesia. He attempted to remove a quadrilateral piece of capsule but succeeded in removing a circular piece. After removing the lens he syringed the capsule with warm saline solution, which cleared the pupil immediately. Vision obtained $\frac{20}{30}$. He prefers this method to the needle operation and waiting for the absorption of the lens matter.

Dr. Valk referred to a case of traumatic cataract operated upon with peripheric section with excellent result.

Dr. Seabrook stated that he had performed several extractions of traumatic cataracts with peripheric section with good results. His experience with linear extraction had not been so good as to the immediate clearing of the pupil.

Dr. Weeks stated that his operations with linear extraction had not always been free from complications. He often had iritis, anterior synechiæ, etc., result. In children under twelve years of age he prefers needling, even if it requires three operations.

Dr. Skeel stated that he had never seen any disastrous results from linear extractions, the only complication was iritis. He admitted that needling was the safest method in children; but when the section was made entirely in the cornea, he thought the

linear method perfectly safe. As to the capsulotomy, he attempted to remove a quadrilateral piece of capsule and had succeeded in many cases. He does not introduce forceps into the eye, but removes the cut piece of capsule by syringing, while removing the detritus in the same manner.

Dr. KOLLER presented a **case of keratitis superficialis punctata (Fuchs).** Sclera was injected. Cornea apparently clear and polished, but when examined with oblique illumination a number of small dots were found scattered over the cornea just beneath the epithelium. Vision was not much disturbed. These cases are usually complicated by some respiratory trouble. Similar to herpes febrilis they usually clear up in a couple of months. Treatment same as iritis serosa.

Dr. WEEKS stated that the case resembled those described by Fuchs, who states that the epithelium was not only raised but roughened. Cause is obscure.

Dr. FRIEDENBERG stated that he had seen similar cases which had yielded in time to the ordinary treatment of iritis serosa.

Dr. LAMBERT presented a **case of epithelioma of the lid** which had been **treated by the X-ray.** Case was that of an adult, and was of six or seven years' duration. It had been cured in seven sittings of fifteen to twenty minutes each; clinically, it was a clear case of epithelioma, but no microscopic report was made. He had treated one other case with equally good result.

Dr. MORTON stated that superficial non-nodular epitheliomas with no glandular involvement can be positively cured. The case referred to him by Dr. Lambert was one in which the epithelioma was about the size of a silver quarter dollar and it had existed five years. The one on the right side of the face had received thirteen treatments, while the one on the left side received six treatments. Both were cured. He dislikes disturbing epitheliomas for the purpose of obtaining sections, as he has seen them, take on a phlegmonous inflammation, which complicates later treatment. There are two methods of treatment:

1. Severe—producing deep burn and necrosis of tissue.

2. Lenient—producing slight burn, consists of fifteen minutes treatment three times a week with moderate X-ray used about three feet distant. He avoids breaking down tissue by not pushing treatment. For lupus he prefers the actinic rays or Finsen's rays.

Dr. BARNES stated that he had treated with the X-ray a case of

epithelioma of the lids in which he had obtained a good result after six sittings.

Dr. DUANE inquired as to the severity of cases in which the X-ray might be used with expectations of good results.

Dr. MORTON stated that he thought every case should be treated at first with the X-ray, as it will do no harm if used properly, and it can produce excellent results. He then described two severe cases in which he had obtained good results. He thought that eyelid cases do better than some of those on the cheek.

Dr. SEABROOK referred to a case of epithelioma of the lids and eye which was treated for six months by the X-ray. The skin cleared up, but where the cornea and sclera were involved it did not do well.

Dr. MORTON thought the result was due more to the method of using the X-ray than anything else.

Dr. WEEKS presented a **case of lenticonus posterior.** The elevation on posterior aspect of the lens was about one half *mm* in height with a small opacity on posterior surface due to remnants of fœtal blood-vessels.

Dr. MEIERHOF read a **report of a case of spontaneous hemorrhage from the conjunctiva in infants.** He stated that hemorrhage of a spontaneous nature in the new-born was not infrequent, but that from the conjunctiva it was comparatively rare, and might be fatal. His case was that of a male child three days old. A solution of silver nitrate had been applied to the lids at birth. The hemorrhage had continued seven hours before he had examined it. The blood formed a clot in the conjunctival sac, and when the clot became too large to be retained, it would be expelled with fresh hemorrhage. This occurred at regular intervals of a few minutes. It was difficult to see the site of the origin of hemorrhage on account of the profuse discharge of blood. A mixture of suprarenal extract was freely applied to the conjunctival sac, without effect. Then gelatine was poured into the conjunctival sac and used externally, which controlled the bleeding for half an hour, but the child crying and straining caused a renewal of the hemorrhage. Finally, upon everting the upper lid, a bleeding spot the area of a split pea in the centre near the edge of the conjunctiva was discovered. The everted lid was drawn up on the supraorbital ridge and firm pressure with iodoform gauze controlled the hemorrhage. The everted lid

was kept in place with a bandage for three hours, when the bandage was removed, and no further hemorrhage occurred. There was no family history of syphilis, tuberculosis, or hemophilia.

Dr. FRIEDENBERG referred to a case he had seen, and which Dr. Jacobi thought was due to infantile scurvy. He stated that Dr. Jacobi advised that the blood be examined in all suspected cases.

Dr. H. R. PRICE read a **report of sympathectomy in a case of glaucoma secondary to hemorrhagic albuminuric retinitis.** Dr. Price's patient was one in which he did not consider an iridectomy a safe procedure, and he had Dr. Rogers perform a sympathectomy; good results and no complications. There have been transient increases in tension since, but vision remained at the full improvement obtained after the operation.

Dr. ROGERS, who performed the operation on Dr. Price's case, **demonstrated the operation upon a prepared specimen.**

MEETING OF NOVEMBER 17th.

PRES. DR. JOHN E. WEEKS IN THE CHAIR.

Dr. REESE presented a case of **melano-sarcoma (traumatic) of the corneal limbus.** He gave the following history: Patient, man aged fifty-five years, was struck in the left eye with a small stone, which caused the eye to bleed. One month later he noticed a dark mass growing at the outer margin of the cornea. When examined six weeks ago it was found that the anterior surface of the cornea was almost entirely covered by a pigmented tumor which sprang from the outer sclero-corneal margin. It was also found that the ocular conjunctiva was pigmented downward and outward for about 2 *mm* from the origin of the growth, while the inferior palpebral conjunctiva presented a few pigmented spots. The tumor was not adherent to the anterior surface of the cornea, consequently, after cutting off enough of it to expose the pupil, he had $\frac{20}{30}$ vision and the fundus was normal upon examination. A microscopical examination showed melano-sarcoma with spindle cells. He thought that the growth started probably from the ciliary body and choroid.

Dr. POOLEY thought it was a melano-sarcoma of the sclero-corneal limbus.

Dr. CALLAN stated that he had seen two or three cases in

which it appeared to spring from the ciliary body, but upon close examination it did not do so, but started from the sclero-corneal limbus.

Dr. KOLLER presented a case of **operation of anterior synechia after Lang's method.** He attempted at first to cut the synechia with Knapp's knife-needle, but the point engaged Descemet's membrane, which prevented a sweeping motion of the knife necessary to cut it. One week later he used Lang's method of first introducing knife-needle and withdrawing it without losing any aqueous, and then inserting a blunt-pointed knife-needle through the opening thus made, and by a sweeping motion succeeded in cutting the synechia, with a good result.

Dr. OATMAN presented a case of **Mules's operation, in which a paraffin** instead of a glass ball **was used as the artificial vitreous.** The stump obtained made an excellent cushion for supporting an artificial eye, with good motility.

Dr. WOLFF presented a case of **traumatic cataract with a cilium implanted in the lens.** The patient had been struck in the eye with a wire. An operation for the removal of the lens mass was performed, and three days later a cilium was discovered implanted in the remaining lens mass.

Dr. MARPLE presented a case of **sarcoma of the choroid.** The patient had noticed vision failing about one week ago and thought that she required glasses; upon examination the fundus presented the appearance of a leuco-sarcoma of the choroid.

Dr. P. A. CALLAN read a paper, **"Should retinal hemorrhages in one eye in simple glaucoma debar an iridectomy in the fellow eye?"** He stated that he did not intend to raise the question of operating in hemorrhagic glaucoma. In such cases there was always an interval between the retinal hemorrhages and the subsequent attack of glaucoma, which was of the inflammatory type. The cases related were of the non-inflammatory form, viz., simple glaucoma. The first case had retinal hemorrhages of the right eye and had never been operated upon. He performed an iridectomy on the left eye three years ago and no bad results had been manifested up to the present time. The second and third cases had been operated upon and were followed by retinal hemorrhages—in the second case at the end of three months, and in the third case at the end of the eighth month. In two of the three cases he operated notwithstanding the hemorrhages. In the other case the hemorrhages affected

the more diseased eye. In none of the cases was the tension very high. He concluded, that although a retinal hemorrhage followed an iridectomy in two of the cases, the interval of time between the operation and the hemorrhage was so long that he could not see any connection between the two, and that the operation was not the cause. A retinal hemorrhage in simple glaucoma is not a bar to an iridectomy on the fellow eye, provided the tension is not too high. Ordinarily the tension is not much increased in these cases, and if in our judgment an iridectomy is required in similar cases, we are justified in operating.

Dr. VALK stated that he thought that an iridectomy should be performed in such cases.

Dr. MITTENDORF agreed with Dr. Callan and thought operation advisable, being guided by the tension if not about T + 1.

Dr. WEEKS emphasized the point that in these cases the hemorrhage was not the cause of the glaucoma.

Dr. CALLAN stated that he had operated upon patients with vision $\frac{2}{10}$ with prodromi in one eye, and glaucoma with very poor vision in the other eye, because glaucoma is sure to occur in the second eye; and the majority of oculists agree that the sooner we operate in glaucoma the better the prognosis and the results.

Dr. DUANE read a paper on "**Some types of retinitis and chorio-retinitis.**" The first type comprised cases of **isolated focal chorio-retinitis.** These, he said, were distinguished by their acute onset, rapid course, and, on the whole, favorable prognosis. They occur especially in young people, and often without assignable cause. They are marked by the presence of a single circumscribed exudate, situated usually not very far from the disc and forming a whitish mass, which may be either prominent and pointed, or low and flattened, and which is often associated with considerable œdema of the surrounding retina, but not often with much engorgement of the papillary vessels or much swelling of the nerve. The amount of impairment of vision depends on the site of the exudate, varying from $\frac{2}{10}$ or better to $\frac{2}{200}$ or $\frac{1}{\infty}$. A more or less absolute scotoma, which may be either positive or negative, frequently remains even after the vision is otherwise restored to normal. The salicylates, calomel in broken doses, and rest in bed furnish the best treatment. Under the second type, that of **plastic chorio-retinitis,** he included not only ordinary retinitis, but also all other varieties of plastic formations in the retina and choroid. He defined it as an affection marked by pretty sharply

circumscribed whitish aggregations of connective tissue which may be sunk in the substance of the retina and choroid, and may stretch along the surface of the retina, or may project out into the vitreous, in which case they sometimes reach forward as far as the lens and ciliary body. Such aggregations may appear under the form of flat, more or less tenuous membranous patches, branching striæ, dense and thick nodular-looking masses, large plateau-like elevations, dense fibrous strands, or fleecy outgrowths. They are attributable to connective-tissue organization taking place in fibrous exudates. The exudates themselves may develop in conjunction with a disseminated choroiditis, which, however, is at times quite inconspicuous; or they may accompany a retinitis, in which case they very frequently originate in a patch of hemorrhage; or they may also probably occur as the result of hemorrhage without inflammation of either retina or choroid. The underlying cause for all these changes (choroiditis, retinitis, hemorrhages, exudates, and connective-tissue products) may be traumatism or may be syphilis, while in other cases still no cause can be made out. (In this statement the author followed Weeks's etiological classification of retinitis proliferans, which latter he regarded as simply one of the varieties of plastic chorio-retinitis.) Once developed, the plastic products are apt to remain unchanged for years, although the slighter formation seemed to be even then still capable of absorption. On the other hand, especially when there are recurrent hemorrhages, the connective-tissue growths may be added to from time to time, thus causing progressive deterioration of the eye. Plastic chorio-retinitis is often accompanied by a great reduction in sight, due partly to the connective-tissue outgrowths, partly to the associated lesions. Mercury and the iodides constitute the best treatment.

The third type considered was that of **retinitis circinata**, the author describing a case having all the characters given by Fuchs (discoloration in the macula and an interrupted ellipse of lobulated non-pigmented white spots surrounding the macula). Also a case of diabetic retinitis, in which white spots were present, typical in arrangement, but without the macular discolorations; and lastly, a case of diabetic retinitis, in which the picture of a retinitis circinata was present for a time and was then followed by that of a retinitis proliferans. The last case thus formed a sort of connecting link between types two and three.

Dr. OPDYKE read a paper, "**The close analogy of trachoma**

to adenoids." Dr. Opdyke stated that he found in the so-called "operative" forms of trachoma, on an average, two out of every three cases had pronounced adenoid vegetations of the pharynx, with all the typically marked symptoms of this affection. He noted the fact that both diseases have many of the same etiological factors: poor environment, bad hygiene, overcrowding, heredity, and the dyscrasiæ, and that all authorities agreed that the liability of an attack of trachoma depends most strongly on the state of the general health at the time of exposure. He thought that none of the conditions mentioned could possibly bring about this condition more forcefully than the evil results subsequent to adenoid vegetations in the pharynx, and that it was not always necessary to hunt for certain race, hygienic causes, or even contagion, as these may be but addenda to a more exciting and persistent factor. He claims that a child with adenoids will contract trachoma quicker than one without them, on account of the lowered vitality resulting from the adenoids. He considers adenoid vegetations to be the primary factor and trachoma as being its true sequel.

SYSTEMATIC REPORT ON THE PROGRESS OF OPHTHALMOLOGY IN THE FIRST QUARTER OF THE YEAR 1902.

By Dr. G. Abelsdorff, in Berlin; Prof. ST. Bernheimer, in Innsbruck; Dr. O. Brecht, Prof. R. Greeff, Prof. C. Horstmann, and Dr. R. Schweigger, in Berlin;

with the assistance of

Dr. A. Alling, New Haven; Prof. E. Berger, Paris; Dr. Dalén, Stockholm; Dr. J. Herrnheiser, Prague; Prof. Hirschmann, Charcow; Dr. J. Jitta, Amsterdam; Dr. Krahnstöver, Rome; Mr. C. Devereux Marshall, London; Dr. P. von Mittelstädt, Metz; Prof. Da Gama Pinto, Lisbon; and others.

Translated by Dr. Ward A. Holden.

Sections I.–III. Reviewed by Professor HORSTMANN, Berlin.

I.—GENERAL OPHTHALMOLOGICAL LITERATURE.

1. **Groenouw** and **Uhthoff.** *Graefe-Saemisch*, 2d edition.
2. **Greeff.** The structure of the eyelid. Demonstration plate. Edited by Magnus. xxiii. Breslau, 1901, Kern.
3. **Magnus.** Guide to the diagnosis of central disturbances of the optical apparatus. *Ibid.*
4. **Elschnig.** Stereoscopic-photographic atlas of the pathological anatomy of the eye. Parts iii.–iv. Vienna and Leipsic, 1902, Braumüller.
5. **Darier.** *Ocular Therapeutics.* 2d edition, Paris, 1902.
6. **Widmark.** On the importance of venereal diseases in the production of blindness. *Hygiea*, March, 1902.
7. **Bock.** The first ten years of the eye department of the Laibach hospital. Vienna, 1902, J. Safar.

8. **Pagenstecher.** Forty-sixth annual report of the charitable ophthalmic institution at Wiesbaden. Wiesbaden, 1902.

9. **Bryson.** Defective vision in children. *Lancet*, March 1, 1902.

10. **Knapp, H.** A few personal recollections of Helmholtz. *Jour. Amer. Med. Assoc.*, March, 1902.

11. **Wood.** Hermann von Helmholtz, the inventor of the ophthalmoscope. *Ibid.*

12. **Hall, W.** The contributions of Helmholtz to physiology and psychology. *Ibid.*

13. **Massachusetts Charitable Eye and Ear Infirmary.** *Seventy-sixth Annual Report, 1901.*

14. **Brooklyn Eye and Ear Hospital.** *Thirty-third Annual Report, 1901.*

15. **New York Ophthalmic and Aural Institute.** Dr. H. Knapp, executive surgeon. *Thirty-second Annual Report for the Year Ending Sept. 30, 1901.*

16. **Jensen.** Second report of his eye clinic. Feb., 1902.

The thirty-seventh and thirty-eighth fascicles of *Graefe-Saemisch*, by GROENOUW (1), treat of the ocular affections in diabetes mellitus, diabetes insipidus, oxaluria and phosphaturia, gout, corpulency, and scrofula; further of the ocular affections in conditions of general weakness, the effect of malignant tumors elsewhere upon the eye, the condition of the eye in sleep and in death, and the hereditary ocular affections.

GREEFF (2) presents a plate of folio size well representing the human lid, which is of great value in ophthalmic teaching.

The second edition of the plate for the diagnosis of central disturbances of the optic apparatus, by MAGNUS (3), is slightly altered from the first edition.

The third and fourth parts of the stereoscopic-photographic atlas of the pathological anatomy of the eye, by ELSCHNIG (4), concludes the work. It contains thirty-two heliotype plates, representing some divided and some undivided eyes of natural size. The execution is very good.

DARIER'S (5) work is a collection of his published views and experiences, particularly with regard to the subconjunctival injection of dionin, acoin, protargol, and massage. The book cannot be considered complete, since many new preparations are not mentioned, and it is questionable whether the new remedies commended will accomplish all that he claims for them.

According to WIDMARK (6), 6.52 % of all the blindness in Sweden is due to gonorrhœa. In regard to syphilis, the exact numbers are harder to obtain, because many cases undoubtedly due to syphilis are classified under other heads. He believes

that probably 15 % of all the blindness in Sweden is due to syphilis. A comparison of his statistics for Sweden with those of Magnus for Germany shows that gonorrhœa in Germany is twice as often a cause of blindness as in Sweden; but he believes that his percentage of 20 for both gonorrhœa and syphilis will hold good for other countries. In conclusion, he discusses the changes in statistics brought about by the use of the Crede method.

DALÉN.

BOCK (7) in the first ten years of his service in the hospital at Laibach saw 7637 patients and performed 3222 operations, of which 913 were for cataract. Among 637 extractions upward with iridectomy, five eyes were lost by suppuration of the wound, fifteen from affections of the eye previously existing, two from hemorrhage, three from the general condition of the patient, and seven through negligence of the patient.

In 1901, PAGENSTECHER (8) treated 2937 eye patients, 954 of whom had hospital treatment, and 128 cataract operations were performed. He adds some remarks on so-called sympathetic glaucoma.

In his report to the Derby School Board, Dr. BRYSON (9) states that out of 700 school children examined by him he found defective eyesight in two thirds of them.

21,880 new eye patients were treated in the out-patient department of the MASS. CHARITABLE EYE AND EAR INFIRMARY (13), 1636 in the hospital wards. Among the 991 operations, there were 206 for cataract extraction and 65 for iridectomy.

For the year 1901, the BROOKLYN EYE AND EAR HOSPITAL (14) had 8122 new patients for the eye. Of the operations 53 were for cataract extraction and 12 for iridectomy.

The NEW YORK OPHTHALMIC AND AURAL INSTITUTE (15) report shows 9129 new patients in the eye department in the dispensary and 537 in the hospital. There were 578 operations (excluding minor ones), of which 137 were cataract extraction and 97 iridectomy.

JENSEN (16) gives a statistical report of the eye diseases treated in his clinic in 1900–1901, and discusses many of the cases which presented points of interest. The number of the patients was 3389; 121 major operations were performed.

II.—GENERAL PATHOLOGY, DIAGNOSIS, AND THERAPEUTICS.

17. **Heine.** The influence of intra-arterial tension on the pupil and intra-ocular tension. *Monatsbl. f. Augenheilk.*, xii., p. 25.

18. **Römer.** Experimental basis for clinical experiment with a serum therapy of serpent ulcer after investigations on pneumococcus immunity. *Graefe's Archiv*, lix., p. 99.

19. **Straub.** Asthenopia. *Geneeskundige Bladen mit Klinick en Laboratorium*, 1901, No. xii.

20. **Seydel.** A contribution to the relearning to see of persons who have become blind. *Klin. Monatsbl. f. Augenheilk.*, xl., p. 97.

21. **Schleich.** Visible circulation in the superficial conjunctival vessels. *Klin. Monatsbl. f. Augenheilk.*, xl., p. 177.

22. **Thorner, W.** On the theory of the determination of refraction. *Arch. f. Augenheilk.*, xlv., p. 110.

23. **Roscher.** On the intraocular use of the galvano-cautery. *Münch. med. Wochenschr.*, 1901, 12, p. 481.

24. **Vinci.** On the diffusion into the eye of some substances injected into the temple. *Ann. di Ottalm.*, xxx., 7.

25. **Dudley, W. H.** Metamorphopsia varians. *Journ. Amer. Med. Assoc.*, Jan. 4, 1902.

26. **Oliver.** Clinical history of a case of blindness from congenital deformity of occiput. *Amer. Journ. Med. Sciences*, Jan., 1902.

27. **Spiller, Wm. G.** A case of complete absence of the visual system in an adult. *Univ. of Penn. Med. Bulletin*, xiv., Feb., 1902.

In experiments on nine cadavers into whose arteries water was introduced, HEINE (17) found in four cases a marked effect upon the pupil. Miosis came on with evident blurring of the markings on the iris, a fact which indicates that there are in fact tissue lesions in the iris with the passing out of blood and water into the stroma of the iris, *i. e.*, not with a dilatation of the vessels alone. From this one might conclude that even excessive arterial tension in life would not affect to a marked degree the size of the pupil. Experiments on living animals also showed that increase of arterial tension *intra vitam* did not affect the width of the pupil. The intraocular tension, on the contrary, was affected by the arterial tension.

The detailed paper by RÖMER (18) can only be reviewed properly when the experiments have been carried farther. He was able to show that in an immune organism the pneumococcus could not develop, and that this protection of the body in general extended to the eye also. This protection obtained in animals must also be obtained in man, and it will then be possible with the further perfection of the serum to combat successfully many diseases.

STRAUB (19) discusses asthenopia, its causes and its therapy, from a purely clinical standpoint.

JITTA.

SEYDEL (20) reports the case of a girl of ten who became completely blind in her seventh year, the left eye having been removed on account of an injury; the sight of the right having been lost from sympathetic ophthalmia. Three years later the opaque lens was removed, leaving an opening in the pupillary area which gave her a certain amount of vision. The child, however, had entirely forgotten how to see, and had to learn again by continued practice.

The second patient was a man of thirty-one, whose left eye was penetrated by a knife blade in his fourth year, and sympathetic ophthalmia destroyed the sight of the other. An iridectomy was made and discission attempted, the latter causing a luxation of the cataractous lens downward. This patient also had forgotten how to see, but three weeks' practice put him again in full possession of his optical faculties. The two cases show that even in the seventh year one may wholly forget how to see. The degree and permanence of this forgetting are dependent upon psychical causes.

With good focal illumination and a magnification of twenty-five diameters, SCHLEICH (21) was able to recognize the blood current in the superficial vessels of the eye. Not only in the large veins but also in the finer arterial and venous vessels down to a diameter of 0.01 *mm* could the circulation be observed. In the thin vessels the movement of the irregularly distributed red corpuscles could be followed.

THORNER (22) calls attention to the difference in the estimation of refraction according to the point from which the far point is measured.

Since in high myopia these differences may be very considerable, he proposes to distinguish two sorts of accommodation—the inner and the outer. The former he reckons from the nodal point of the eye, and the latter from a point 1 *cm* anterior to the cornea. Since it is easy to determine the outer refraction, but not easy to determine the inner, Thorner has given a table in which every value found for the external refraction is accompanied with the corresponding value of the internal refraction. He discusses further the point that is to be considered the zero point in the usual methods of objective determination of the refraction. Finally he describes the method of objectively determining refraction with his ophthalmoscope, which is free from reflexes, and shows how, by means of a special arrangement, the

plane of the iris in the person examined can be kept in a constant location.

ROSCHER (23), in five cases of incipient panophthalmitis, employed the intraocular galvano-caustic method of Millinger with success.

OLIVER'S (26) case presented moderate exophthalmus, divergent strabismus, and rotary nystagmus. There was absolutely no other lesion of the eyes. There was no light perception. The occipital protuberances were almost entirely wanting. The case is an extremely rare instance of imperfect development of the visual cortex, with loss of its function. ALLING.

SPILLER (27) had the exceptional opportunity of making a pathological examination of a case of absence of the visual system in an idiot, twenty-two years of age. The body was that of a child apparently about twelve years old. The palpebral fissures were extremely small, and the orbits contained only fibrous connective tissue, although permission was not given to remove their contents. Nothing resembling eyeballs could be seen. There were no optic foramina, no optic nerves, chiasm, or optic tracts. There was no sign of an external geniculate body on either side, and the optic thalamus had no fibres resembling optic tract entering it. The posterior part of the thalamus was large and rounded. The anterior corpora quadrigemina were as large as the posterior. The occipital lobes were small and the cuneus was poorly developed, with the calcarine fissure short.

Microscopic examination showed nerve cell bodies slightly less numerous than normal in the cortex of the calcarine fissure. The optic radiations were not entirely absent, but not very distinct. Meynert's fibres, which are supposed to connect the optic tract with the third-nerve nucleus, were fully developed, which would indicate that they are not concerned in the pupil reflex alone. Only a few fibres were found in the pulvinar of the optic thalamus. All the ocular nerves were well developed, except the two sixth nerves—a fact which might be explained on the supposition that rudimentary muscles were present in the orbit. The following conclusions are drawn by the author: The chief "primary" optic ganglion is the external geniculate body. The pulvinar of the optic thalamus is an important "primary" optic centre. The anterior quadrigeminal body has not an important relation to vision. The hypothalamic body, the habenula, and the internal geniculate body, probably, are not part of the visual system. The

cortex of the calcarine fissure may contain nearly the normal number of cell bodies, even though the visual system may be undeveloped. The nerves to the ocular muscles and their nuclei may be developed, even though the visual system is absent.

ALLING.

III.—INSTRUMENTS AND REMEDIES.

28. **Salffner.** Clinical observations on jequiritol and jequiritol serum. *Arch. f. Augenheilk.*, xliv., p. 322.

29. **Hummelheim.** On jequirity therapy. *Zeitschr. f. Augenheilk.*, vii., p. 290.

30. **Guttmann.** Ichthargan in ophthalmology. *Arch. f. Ther. u. Hyg. d. Auges*, June 5, 1902.

31. **v. Arlt, F. R.** On the use of cuprum citricum in trachoma. *Centralbl. f. pract. Augenheilk.*, xxvi., p. 80.

32. **Phisalix.** Physiological investigations in regard to the effect of ibogaine upon the nervous system in general, and on the cornea in particular. *Bull. de la soc. de biologie de Paris*, Dec. 7, 1901.

33. **Galezowski.** On hermophenyl and its employment in ophthalmology. *Rec. d'opht.*, xxiv., 1, p. 55.

34. **Batalow.** Report on the action of dionin upon the eye. *Wjest. Ophth.*, No. 1, 1902.

35. **Annin.** The action of tropococain upon the eye. *Ibid.*, No. 2, 1902.

36. **Volkmann.** The theory of eye magnets. *Klin. Monatsbl. f. Augenheilk.*, xl., p. 1.

37. **Volkmann.** A new eye magnet. *Ibid.*, p. 116.

38. **Rémy.** Applications of the diploscope to the diagnosis and treatment of alterations of binocular vision. *Rec. d'opht.*, xxiv., 1, p. 1.

39. **Schmidt-Rimpler.** On a new method of seeing objects in relief with one eye only. *Centralbl. f. prakt. Augenheilk.*, xxvi., p. 1.

40. **Landolt.** A cystotome. *Arch. f. opht.*, xxii., 2, p. 90.

41. **Pooley.** The sideroscope. *N. Y. Med. Journ.*, March 8, 1902.

42. **Williams, C. H.** Incandescent electric light for ophthalmoscopic examinations. *Trans. Amer. Ophth. Soc.*, 1901.

SALFFNER (28) treated fourteen cases of chronic eczematous keratitis with jequiritol. Usually there were fresh infiltrations with old scars, and often there was pannus. All had failed to improve under other treatments. After jequirity treatment the dense opacities were always somewhat cleared up and the eczematous processes were lessened. The results were less favorable in corneal opacities due to parenchymatous processes.

According to HUMMELHEIM (29) jequiritol has the same curative effect as jequirity. But it has the advantage that the dosage may be regulated and a regular increase in the action

of the abrin obtained, so that a permanent injury of the eye may be avoided. It is useful in trachoma and trachomatous pannus.

GUTTMANN (30) used ichthargan on sixty-one eye patients. He found it useful in "Schwellungs-catarrh," but in blennorrhœa further experiments must be made. It diminishes the secretion in dacryocystitis. It is especially recommended in trachoma and trachomatous pannus. A 0.5–2 % solution is dropped into the eye.

ARLT (31) recommends in trachoma cuprum citricum in 5–10 % ointment. This is placed deep in the cul-de-sac and massage is then performed.

PHISALIX (32) found that the alkaloid ibogaine obtained from a plant in the Congo called iboga, when instilled in 1 % solution into the eye caused anæsthesia of the cornea and congestion of the conjunctiva. The pupil is not affected. BERGER.

GALEZOWSKI (33) recommends as an antiseptic a new mercurial preparation—hermophenyl, which does not precipitate albumen. It is used in 1:2000 aqueous solution, or, when there is pain, combined with dionin (hermophenyl 0.05, dionin 0.15, vaselin liq. 25.00 three times daily). It is adapted for subcutaneous use in the treatment of syphilitic affections of the eye.

BERGER.

The results of BATALOW'S (34) clinical experimental investigations are as follows: 1. Dionin in solution (3–10 %) or powder form when introduced into the conjunctival sac always causes injection, a sensation of burning, lachrymation, and often a non-inflammatory chemosis. 2. The appearance of chemosis and its extent depend upon the strength of the solution, the age of the patient, and his individual disposition; when the use of dionin is repeated the chemosis does not appear. 3. Dionin is not a myotic; the contraction of the pupil which it causes is only a reflex symptom. 4. Dionin does not affect the accommodation. 5. It does not increase intraocular tension. 6. It favors diffusion from the conjunctival sac into the anterior chamber. The microscopic examination of dogs' eyes after the use of dionin revealed dilatation of the blood and lymph vessels of the conjunctiva. 7. Dionin favors the absorption of fresh corneal opacities, phlyctenulæ, episcleritic foci, and corneal infiltrations. 8. The intense analgesic effect of 10 % dionin solution is manifest in all cases, particularly in iridocyclitis, acute glaucoma, and similar processes.

HIRSCHMANN.

ANNIN (35) uses 3–5 % solutions of tropococain mur. for instillations and a 2 % solution in salt for subconjunctival and subcutaneous injection. Even after long boiling these solutions remain clear and their efficacy unchanged. After instillation the cornea retains its lustre, but becomes anæsthetic in a minute. Complete anæsthesia lasts from two to seven minutes, and incomplete from two to thirteen minutes. It exercises no effect upon the pupil or the intraocular tension. In eye operations 2–3 % solutions are used. HIRSCHMANN.

According to VOLKMANN (36) the size of an iron splinter is of less importance than its shape in regard to the strength of magnet required for its extraction. VOLKMANN'S (37) ideas as to the dimensions and shape of magnet have been carried out in his new instrument.

RÉMY (38) recommends a diploscope manufactured according to his plans by E. Venchat, of Paris. Its purpose is to discover the rôle of each eye in binocular vision (one eye—Tscherning's "œil directeur"—being, as is well known, of more importance), to assist in determining the refraction in anisometropia, to discover the binocular vision of squint patients, and finally to determine the angle of the squint. The original paper must be consulted as to theory and practical application of the instrument. BERGER.

In order to see objects in relief with one eye SCHMIDT-RIMPLER (39) has devised an instrument similar to a reversed Giraud-Teulon binocular ophthalmoscope. Two images the intraocular distance apart from each other are brought into one eye.

LANDOLT (40) rightly states that the technic of splitting the capsule, unlike that of making the corneal section, about which volumes have been written, has received relatively little attention. His flexible cystotome in the form of a small sharp sickle-shaped knife meets all the requirements and lacks all the disadvantages of other forms which on account of their narrowness cannot be made sufficiently sharp. V. MITTELSTÄDT.

The direct object of this communication by POOLEY (41) is to show that he was the first to employ the magnetic needle for the purpose of determining the presence of iron or steel in the eye. ALLING.

Sections IV.–VII. Reviewed by DR. ABELSDORFF, Berlin.

IV.—ANATOMY.

43. **Velhagen.** An unusual condition found in a retina stained by Golgi's method. *Graefe's Archiv*, liii., 3, p. 499.

44. **Berl.** Remarks on the relations of the visual tracts to the anterior corpora quadrigemina in the rabbit. *Arbeiten a. d. neurol. Institut a. d. Wiener Universität*, viii., 1902.

45. **Symens.** Microscopic findings in a myopic nasal conus. *Arch. f. Augenheilk.*, xliv., p. 336.

46. **Szili.** On the anatomy and embryology of the posterior layers of the iris, with special reference to the sphincter pupillæ muscle in man. *Graefe's Archiv*, liii., 3, p. 460.

47. **Herzog.** On the development of the intrinsic musculature of the eye. *Zeitschr. f. Augenheilk.*, vii., 1, p. 47, and vii., 2, p. 155.

48. **Stock.** A contribution to the question of a dilatator iridis. *Klin. Monatsbl. f. Augenheilk.*, xl., p. 57.

49. **Wölfflin.** A clinical contribution to the subject of the structure of the iris. *Arch. f. Augenheilk.*, xlv., p. 1.

VELHAGEN (43) describes and pictures the retina of an ox stained by Golgi's method, in which the end nodules of the rods are continued uninterruptedly into the nerve fibres. Possibly this was an anomaly.

BERL (44), after removing the occipital region of rabbits on one side and killing them four weeks later, in order to study the location of the optic fibres in the anterior corpora quadrigemina, concluded that the termination of the cortex-corpus quadrigeminum tract, like the termination of the retina-corpus quadrigeminum tract, lay in the white layer beneath the superficial gray. The corpus quadrigeminum of the same side as the injury was alone degenerated.

In animals in which the eye of the same side was enucleated also, a partial crossing in the chiasm could be determined.

SYMENS (45) found in the region of the conus in a myopic eye an absence of the rods and cones and pigment epithelial. The choroid extended on the nasal side much deeper into the tissues of the optic nerve than on the temporal. On the nasal side there was no retraction of the lamina vitrea, but rather a supertraction.

SZILI's (46) investigations, made on 15 embryos, several newborn infants, and adults, in v. Lenhossék's anatomical institute at Buda Pesth, led to important conclusions, of which the following may be mentioned :

The sphincter and dilatator pupillæ arise genetically from the

epithelial portion of the iris; the ciliary processes are formed not only in the ciliary region but also in the region of the primitive iris, from which they draw back about the fifth month.

At the beginning of the fourth month, the proton of the sphincter can be seen as a collection of cells within the epithelium, where it turns back upon itself, and from the seventh month the transformation of the anterior layer of epithelial cells into the dilatator can be followed. In the adult, the nucleated cellular portion, in combination with the contractile fibres, makes up the epithelial muscle cells of the dilatator. The dilatator is inserted at its pupillary end into the sphincter, while its ciliary fibres extend in part to the ligamentum and in part to the ciliary muscle.

HERZOG'S (47) preliminary report on the development of the intrinsic muscles is not in entire accord with that of Szili. The sphincter develops from an epithelial proliferation, at the anterior and inner portion of the epithelial layer, where it turns back upon itself. In the formation of the dilatator the pigment epithelial cells send out protoplasmic processes toward the pupil. These processes form a continuous muscular layer. The ciliary muscle is not developed from the epithelium of the secondary vesicle, but from mesodermic tissue.

STOCK (48) presents a drawing of the iris of a fish otter, in which sphincter and dilatator are so well developed that the existence of the latter as an unstriped muscle cannot be doubted.

WÖLFFLIN (49) remarks that there is a marked difference between brown and blue irides, in that the trabeculæ are more marked in the latter. The trabeculæ, in 10 % of all cases seen with the corneal microscope, show a broadening at the ciliary end in the form of a white nodule.

V.—PHYSIOLOGY.

50. **Borschke and Hescheles.** On the after-images of moving objects. *Zeitschr. f. Psychol. u. Physiol. d. Sinnesorgane*, xxvii., p. 387.

51. **Feilchenfeld.** On the judgment of size in the visual field. *Graefe's Archiv*, liii., 3, p. 401.

52. **Du Bois Reymond.** On subjective projection. *Zeitschr. f. Psych. u. Physiol. d. Sinnesorgane*, xxvii., p. 399.

53. **Colombo.** Experimental measurements of hemeralopia and of the retinal purple. *Ann. d'Ottalm.*, xxx., 8–9, 10–11, 12.

54. **Jackson.** Centring and decentring of lenses before the eye. *Ophth. Rec.*, 1902.

BORSCHKE and HESCHELES (50) came to the following conclu-

sions: 1. The rapidity of the after-image is directly proportional to that of the object observed when the movement of the latter is not too fast. 2. The rapidity of the movement of the after-image increases with the number of excitations to the time unit. 3. The perceptibility of the object accelerates the movement of the after-image.

FEILCHENFELD (51) used for the estimation of sizes with an unchanged point of fixation a cross placed in a frontal plane. The comparison of the length of the four arms was always correct in a small field, but when the angle was increased by approaching the cross to the eye, the nasal arm was overestimated. The author explains this error by the fact that the horizontal arm occupies the entire horizontal extent of the nasal field, but does not fill the more extensive temporal half. In the same way the upper arm is overestimated in the vertical direction.

When the direction of the gaze is altered—for example, when one is asked to divide a horizontal line, using one eye only, the temporal portion is overestimated.

R. DU BOIS REYMOND (52), in order to get an impression of the vision of animals with divergent lines of vision, placed a laterally inclined mirror before each eye. Naturally, however, objects at the side were projected straight forward, and rivalry of the two fields ensued, so that the conditions in no way resembled those in the lower animals.

COLOMBO'S (53) paper treats of the following questions: 1. Is the smallest amount of light perceptible by the normal eye a constant for a given eye with a uniform mode of measurement? 2. Is the smallest perceptible amount of light constant for a given visual angle? 3. When different normal eyes at the beginning of the examination have vision less than the maximum on account of insufficient light, and by increasing the illumination of the test types recognition under a smaller visual angle is obtained—does then the quantity of light necessary to increase vision from one visual angle to the next smaller stand in a constant relation to the light unit originally assumed?

These and other questions of a similar sort have been carefully studied, and the utmost pains taken with the measurements, but the results appear somewhat unsatisfactory, as it is apt to be the case when subjective experiments are long continued with a single individual. KRANSTÖVER.

After a discussion of the effect of decentring spherical lenses,

JACKSON (54) presents a table showing the amount of prismatic effect, both horizontal and vertical, produced by the decentring of cylinders at any axis of obliquity. ALLING.

VI.—REFRACTION AND ACCOMMODATION.

55. **Treutler.** Some remarks on the schematic eye. *Klin. Monatsbl. f. Augenheilk.*, xl., p. 211.

56. **Weiss.** On the spherical aberration of the eye. *Compt. rend. de l'académie d. sciences d. Paris*, Jan. 13, 1902.

57. **Neustätter.** On the course of the rays in skiascopy. A disproval of Heine's views. *Klin. Monatsbl. f. Augenheilk.*, xl., p. 143.

58. **Wolff.** On skiaskopy therapy, skiascopic determination of refraction, and my electric skiaskopophthalmometer. *Zeitschr. f. Augenheilk.*, vii., 3, p. 213.

59. **Meyerhof, M.** On the increase of high myopia from under-correction for near. *Klin. Monatsbl. f. Augenheilk.*, xl., p. 200.

60. **Roscher.** Myopia statistics from Dr. Rückert's eye clinic at Zittau. A contribution to the subject of full correction. *Ibid.*, xl., p. 191.

61. **Schreiber.** How is myopia best corrected? *Ibid.*, p. 19.

62. **Bjerke.** On the alterations in refraction and acuteness of vision after removal of the lens. *Graefe's Archiv*, liii., 3, p. 511.

According to TREUTLER (55), the schematic eye, made without a lens, should be corrected with a + 10.5 D lens, with its posterior surface 13 *mm* from the apex of the cornea; secondly, the far point of that myopic eye which aphakic is emmetropic should be 67 *mm* before the cornea; and, thirdly, the schematic and emmetropic eye should be 23–24 *mm* long. These three conditions were proved on the schematic eyes of Helmholtz, Stadlfeldt, and Tscherning, and the values altered in accordance with the requirements of the foregoing modifications.

WEISS (56) calls attention to the following evidence of spherical aberration in the eye. When one looks toward the sky through a pinhole in a card, he sees in the centre a dark irregular spot, which disappears when one holds a diaphragm 2 *mm* in diameter immediately before the eye. BERGER.

NEUSTÄTTER (57) criticises Heine's scheme of the course of the ray in skiascopy, published in the *Klin. Monatsbl. f. Augenheilk.* He states that Roth has already shown in the same journal the applicability of the katopric law on the diffuse reflection from the fundus, points out the neglecting of the distance between observer and observed, and claims, among other things, as an

error in construction, that Heine has drawn his scheme as if from two separate points at an infinite distance the rays enter the eye parallel to the axial ray.

MEYERHOF'S (59) collection is taken from the material of Augstein, who under-corrects myopia 0.5–2. D for distance and 3.–4. D for near, and in high myopia rarely orders a lens stronger than 8. D. Among 61 cases of myopia of at least 0.5 D, and a period of observation of at least one year, the patients, with four exceptions, being under twenty, the relation of stationary to progressive cases was 31:30. The degree of myopia in these statistics did not seem to affect the progressiveness, since of the myopes of 10 D and over only half were progressive. On the other hand, it was evident that the progression is most marked in the school period, for among the markedly progressive cases 74 % were in children under fifteen.

ROSCHER (60) has collected the material observed by Rückert over a period of ten years. Of 40 cases of myopia which were fully or slightly under-corrected, 28 remained stationary, 8 progressed 1.–2. D, and 4 progressed 2.5–4. D. Of 18 under-corrected cases, only 2 were stationary, 5 slightly and 11 markedly progressive. The period of control and the age being similar in the corrected and the uncorrected cases, the results of under-correction appear very unfavorable.

SCHREIBER'S (61) tabulated observations show that the greatest increase in myopia takes place between the ages of seven and fourteen. For this period he recommends full correction of myopia of 1.25 or over, provided the patient can accommodate up to $\frac{1}{4}$ *m*. In myopes of twenty years or older, who previously have not been fully corrected, he does not give the full correction, which usually is uncomfortable, and furthermore, myopia is apt to be stationary after this age.

BJERKE'S (62) computations and tables show that with equal refraction of eyes containing a lens the refraction after removal, as shown by clinical experience, may be different, dependent upon:

1. The different corneal refraction with increased myopia in the eye with a lens, the different refraction of the lens, and the removal of the anterior surface of the lens from the cornea.

2. The change in the distance of the anterior surface of the lens from the cornea of 0.5 *mm* with increasing refraction of the eye, lens, and cornea.

3. The change in refrangibility of the lens of 1.0 with increasing refraction of the eye with the lens, diminishing corneal refraction, and removal of the anterior pole of the lens from the cornea.

The clinical fact that eyes with different degrees of myopia may become emmetropic after removal of the lens cannot be explained by changes in corneal refraction and the increased distance between cornea and lens. The author assumes rather a change in diameter of the refracting surfaces of the lenses.

In conclusion the author presents a small table in regard to the increase of acuteness of vision through enlargement of the retinal image after removal of the lens in different refractions.

VII.—MUSCLES AND NERVES.

63. **Salomonsohn.** On unilateral innervation of the frontalis muscle in cases of bilateral oculomotor paralysis. A new ptosis glass. *Berliner klin. Wochenschr.*, 1901, p. 693.

64. **Loeser.** A peculiar combination of abducens paresis and hemianopsia with a contribution to the theory of the disturbance in ocular measurements in the hemianopic. *Arch. f. Augenheilk.*, xlv., 1, p. 39.

65. **Stanculeanu.** Two cases of paralysis of the superior oblique after radical treatment of frontal sinus inflammation. *Arch. d'opht.*, xxii., 1, 32.

66. **Landolt, M.** A peculiarity in the symptoms of certain ocular paralyses. *Ibid.*, xxii., 1, p. 41.

67. **Koster.** Operative treatment of strabismus. *Tydschr. v. Geneesk.*, 1902, ii., No. 6.

68. **Meige** and **Feindel.** The treatment of tics by immobilization of the movements and movements of immobilization (Brissaud's method). *Presse méd.*, 1902, No. 22.

69. **Valude.** Rupture of the ligamentous extension of the internal rectus and the inferior rectus by traumatism; reparation. *Bull. de la soc. d'opht. de Paris*, Feb. 7, 1902.

70. **Bär.** Reflex nystagmus. *Arch. f. Augenheilk.*, xlv., p. 5.

71. **Peters.** Is miner's nystagmus of labyrinthine origin? *Ibid.*, xliv., p. 301.

72. **Antonelli.** A point in the history of strabismus operations. *Arch. d'opht.*, xxii., p. 45.

73. **Meyerhof.** On the history of the lid-closure reaction of the pupil. *Berliner klin. Wochenschr.*, No. 5, p. 20.

74. **Boas.** On the centre for reflex contraction of the pupil and on the location and nature of iridoplegia. *Münch. med. Wochenschr.*, No. 10, p. 406.

75. **Todd.** A secure advancement operation performed with the aid of a new tendon tucker. *Ophth. Rec.*, Feb., 1902.

SALOMONSOHN (63) observed, in a patient of forty-nine with bilateral oculomotor paralysis, a unilateral innervation of the frontalis muscle which relieved the right ptosis by raising the

brow. The innervation extended also to the facial nerve. The instrument for relieving the ptosis, a wire curved into a spring and fastened to the bow of the glasses, has already been described by A. Meyer in THESE ARCHIVES.

LOESER (64) observed in Oppenheim's policlinic for neurology a patient with left homonymous hemianopsia and right paralysis of the abducens. When the gaze was directed straight forward there were no double images, since in fixation with the right eye the image going to the left adducted eye fell upon the blind nasal half of the retina. The over-estimation of a horizontal line on the side of the defect, as described by Liepmann and Kalmus, could not be demonstrated in this case. Since in uniocular examinations there was no difference in estimation by the right and the left eye with paralysis of the abducens, the author does not accept the explanation of kinetic disturbance in hemianopsia as suggested by the writers above and rather accepts the factor proposed by Feilchenfeld (earlier in this report)—namely, the form of the field of vision.

STANCULEANU (65) saw, in two cases of suppuration of the frontal sinus in which Kuhnt's radical operation was performed, a paralysis of the superior oblique and in one case of the internal rectus also, caused by disturbance of the pulley of the superior oblique in the operation. If the removal of the anterior wall of the sinus can lead to injury of the trochlea, the danger is even greater when the operation is undertaken through the orbit. [In neither method should the tendon of the superior oblique be severed. In the operation of Jansen the pulley of the superior oblique is detached with the periorbita from the superior orbital margin and is stitched to its former place with the orbital flap. In cases of small sinus the superior oblique need not be disturbed. I have not seen any permanent diplopia after Jansen's operation, which is excellent (see ARCH. OF OPHTH., vol. xxviii.).—H. K.]

LANDOLT (66) reports two cases in which the better seeing paralyzed eye performed fixation while the unparalyzed eye was deflected.

KOSTER (67) operates according to Arlt's method, but he regulates the effect by extending the lateral incision and thus gets a correction as high as 25°. Instead of making his incision perpendicular to the direction of the muscle, he makes it at an angle of 45° so that the muscle can retract farther.

Koster then describes a method of shortening the muscle. He makes a horizontal incision 1 *cm* long in the conjunctiva and in the middle of the tendon and the muscle and then separates the tendon from the sclera. Two double-armed sutures are then passed from outward inward through the muscle and through the episclera at the point of insertion of the tendon. After the tenotomy of the antagonist has been performed, the sutures are knotted and the conjunctiva sutured above. JITTA.

MEIGE and FEINDEL (68) recommend systematic exercises in the treatment of tic of the lids and nystagmus. In chronic blepharospasm, the patient is directed to keep the eyes closed for a time and then to keep them open. In cases of nystagmus, the head is mobilized and the eyes are directed toward particular objects in various directions, or the head is moved while the patient is directed to fixate the same objects constantly.

BERGER.

VALUDE (69) observed a patient in whom after a tearing injury of the lower lid a deviation of this eye up and out appeared, with corresponding double images. Valude assumed that there had been a rupture of the check ligament extending from the orbital margin to the muscle sheath, and attempted by capsular advancement to rectify the position of the eye. After two operations this was accomplished. BERGER.

BÄR (70) observed six cases in the University Clinic at Innsbruck in which irritation of the conjunctiva or cornea from inflammation or foreign body caused a horizontal nystagmus with hippus which passed off when the cause was removed. In all the cases there was hypeiopia, with latent or manifest divergent strabismus in four and convergent strabismus in one.

The author concludes therefore that excitation of the fifth nerve may bring about nystagmus and more readily when the musculature per se is somewhat weakened. The reflex excitation travels from the peripheral termination of the trigeminus to the spinal terminal nucleus of the trigeminus root and from here through the dorsal longitudinal bundle to the oculomotor.

PETERS (71) would explain miner's nystagmus through the vestibular apparatus of the ear. The throwing back of the head and the turning up of the eyes produce a new condition of equilibrium. On returning from work with the head straight and the eye directed forward, the altered position of equilibrium causes

another distribution of the endolymph, and thus an excitation in the vestibular apparatus, which reflexly is transferred to the eye muscles. By throwing back the head to a mean acquired position of equilibrium the nystagmus can be prevented or decreased.

ANTONELLI (72) refutes the general idea that John Taylor (1738) first cured strabismus by tenotomy. Taylor's practice was to pass a suture through the bulbar conjunctiva near the insertion of the tendon, raise up a fold, and cut it off. Covering the other eye immediately with a plaster it demonstrated to the astonished spectators that the squinting eye now looked straight forward. Lecat saw through the deception and Taylor then informed him that he cut a nerve which innervated the muscle too strongly. Lecat on a certain occasion presented him with an anatomical preparation and asked him to demonstrate this nerve, at which Taylor saw himself exposed and acknowledged the trickery. v. MITTELSTÄDT.

MEYERHOF (73) cites an observation of v. Graefe (*Graefe's Archiv*, vol. i., p. 318, 1854), from which it is clear that the newly discovered reaction of the pupil to closure of the lid was methodically observed by v. Graefe.

TODD'S (75) instrument has two prongs which when placed on either side of the muscle and allowed to cross produce a fold through which sutures can easily be passed. ALLING.

Sections VIII–XII. Reviewed by DR. R. SCHWEIGGER, Berlin.

VIII.—LIDS.

76. **Knapp, H.** A case of adenoma of the Meibomian glands with a synopsis of what is known of that kind of tumor. *Trans. Amer. Ophth. Soc.*, 1901.

77. **Morax.** Necrosis and gangrene of the lids. *Ann. d'ocul.*, cxxvii., p. 43, and *Bull. de la soc. d'opht. de Paris*, Jan. 7, 1902.

78. **Grossetti** and **de Vincentiis.** Clinical and critical considerations regarding four further operations by Motais's method in congenital blepharoptosis. *Ann. di Ottalm.*, xxx., p. 7.

79. **Kuhnt.** On the value of lid formation by the transplantation of skin flaps without a pedicle. *Zeitschr. f. Augenheilk.*, vii., pp. 19 and 97.

80. **Sachs, M.** A contribution to operative ophthalmology; plastic operations on the lids. *Ibid.*, p. 44.

81. **Koenigshoeffer.** Elephantiasis lymphangiectatica and lymphangioma cavernosum of the lids. *Ophth. Klinik*, 1902, No. 1.

KNAPP's (76) case presented a nodular tumor showing yellowish white through the skin of the upper lid. On everting the lid the whole mass was seen to be an aggregation of hypertrophied Meibomian glands. Parts of the tumor were excised at times but returned, and finally the whole mass with the tarsal portion of the upper lid was removed. The cornea was protected by paring the edges and uniting the outer half of the lower lid with the remains of the upper lid. Eight cases of a similar nature are cited. ALLING.

On the basis of two observations of his own on non-fœtid necrosis of the lids from streptococcus infection and the previous literature of the subject, MORAX (77) recommends that the designation "necrosis" of the lids be applied to non-putrid losses of substance caused by streptococci or staphylococci, while "gangrene" of the lid should be used only to designate the tissue necrosis caused by the aërobic micro-organisms. BERGER.

On the basis of four new cases of Motais's ptosis operation, GROSSETTI and VINCENTIIS (78) discuss the manner of function of the lid, which is solely dependent upon the function of the superior rectus, which is mechanically connected with the lid. The motility is complete when the line of gaze is elevated, and in looking directly forward the width of the palpebral aperture of the operated eye is normal. When with the eyebrow fixed by compression the patient attempts to open the eye wide no widening of the palpebral aperture is observed in the operated eye. The normal opening in looking straight forward thus depends solely upon the tone of the superior rectus and not at all upon the elevator of the upper lid. The authors believe that the lamellæ detached from the superior rectus and implanted at the margin of the lid preserve their musculo-tendinous character and do not undergo connective-tissue degeneration, from the fact that the muscle with the lapse of time loses nothing of its functional breadth on the eyeball nor of the elevation of the lid that occurs with its contraction. KRAHNSTÖVER.

While for cases of ectropium with thin cicatricial tissue surrounding the bone the transplantation of skin instead of the use of pedunculated flaps is advocated by other authors, KUHNT (79) prefers the former method as having many advantages. The latter often produces too thick and heavy lids with the appearance of ptosis or entropium. The transplantation of a large flap

after the method of Le Fort-Wolfe and the simpler method of grafting fine Thiersch flaps are equally successful in the author's hands. Naturally in every plastic operation the patient must not be suffering from dyscrasias, chronic suppurations, or diseases of the orbit or neighboring cavities, and the inflammatory shrinking must have been long at rest.

Because of the shrinking during the healing process Kuhnt makes the flap at least twice as large as the defect and pushes it under the healthy margin of the wound instead of suturing. The lid is held tense during the healing and it is cleared of all cicatricial masses. The flap is applied only after all bleeding has ceased, and if there is a prospect of secretion beneath it several holes are cut in it. After some time, massage helps the smoothing out of the scar. Kuhnt's results are illustrated in detail by tables and diagrams.

SACHS (80), in cases of cicatricial ectropium, uses a single large Thiersch flap removed with a curved lance. Only a gauze bandage is applied. The same flap is used by Sachs to line the orbit or to enlarge the conjunctival sac so that an artificial eye may be worn. In this operation he shifts the mucosa downward on the posterior surface of the lid and covers the orbital tissues from upper to lower cul-de-sac with flaps of epidermis.

IX.—LACHRYMAL APPARATUS.

82. **Forck.** Sarcoma of the lachrymal gland removed by Krönlein's method with a modification in technic. *N. Y. med. Wochenschr.*, Jan., 1902.

83. **Dalén.** A case of bilateral congenital fistula of the lachrymal sac. *Hygiea*, Feb., 1902.

84. **Caspar.** Diphtheritic gangrene of the lachrymal sac. *Centralbl. f Augenheilk.*, xxvi., 3, p. 83.

85. **Bettremieux.** The neuralgia of persons having lachrymation. (Lesions of the lachrymo-nasal mucosa considered in their relations to facial neuralgias and tics). *Bull. de la soc. belge d'opht.*, Nov. 24, 1901.

86. **Mittendorf.** Dislocation of the lachrymal gland. *Trans. Amer. Ophth. Soc.*, 1901.

, DALÉN'S (83) case was in a girl of six. On both sides, 4 *mm* medial and a little below the internal canthi, there were small round fistulous openings, through which a clear liquid exuded, taking on a green color when fluorescin was dropped into the conjunctival sac. The nasal duct was permeable on each side. There were no evidences of previous inflammation and the con-

dition was doubtless congenital. The author refers to previously described cases of this sort and discusses briefly the probable manner of their development.

X.—ORBIT.

87. **Laas.** A case of bilateral orbital phlegmon with recovery and preservation of vision in both eyes. *Zeitschr. f. Augenheilk.*, vii., p. 179.

88. **Goldzieher.** A contribution to the subject of symmetrical tumors of the orbit. *Ibid.*, p. 9.

89. **Goldzieher.** Orbital syphilis. *Magyar Crvosok Lapja*, 1902.

90. **Köhler.** Osteoma of the superior wall of the orbit. *Deutsche med. Wochenschr.*, Vereinsbeil. 24, p. 184.

91. **Kalt.** Orbital cysts with vegetating walls and of sudden development. *Ann. d'ocul.*, jan., 1902.

Laas (87) observed in a young man, after a furuncle at the root of the nose, with œdema of the lids on both sides, an exophthalmus of the right eye appearing two weeks later, with marked general disturbances and later exophthalmus of the left eye.

The condition was complicated with high temperature, diminished frequency of the pulse, vomiting, headache, and bleeding from the nose. In the right eye there was a typical choked disc, and there were many abscesses about the eye. Particularly unusual were light yellow spots within the eye that suggested tumor and detachment of the retina, which were taken to be subchoroidal exudations. The epibulbar abscess scars caused an astigmatism and the orbital changes a strabismus.

Goldzieher (88) reported a peculiar case of symmetrical tumor formation in the orbit. A girl of sixteen, a virgin, had a large fibrosarcoma removed from one orbit, and a month later both eyes were protruding from new formations in the orbit which could not be extirpated cleanly and appeared to be a pure cicatricial tissue poor in cells.

The protrusion of the ball increased and the patient died of pneumonia. The same tissue that filled the orbit and there in places exhibited bony structure was found also in the liver and spleen, on the top of the skull, and in the tissues before the spinal column. The author did not believe this to be sarcomatous, but rather a chronic inflammatory product, such as constitutional syphilis causes.

XI.—CONJUNCTIVA.

92. **Morax.** The differentiation between granular and acute infectious conjunctivitis. *Ann. d'ocul.*, cxxviii., p. 199.

93. **De Wecker.** The transmission of trachoma in Egypt. An open letter addressed to Messrs. Morax and Lakah. *Ibid.*, p. 54.

94. **Von Arlt, F. R.** On the use of cuprum citricum in trachoma. Preliminary report. *Centralbl. f. Augenheilk.*, xxvi., 3, p. 80.

95. **Goldzieher.** A contribution to the therapy of trachoma. *Wiener med. Wochenschr.*, No. 9, 1902.

96. **Werschbitzky.** The treatment of trachoma with ichthyol. *Wojenno Med. Journ.*, 1901, xi.

97. **Mrongovius.** The treatment of trachoma with ichthargan. *Ibid.*, 1902, iii.

98. **Bassalino.** Primary tuberculosis of the bulbar conjunctiva. *Ann. di Ottalm.*, xxx., 7.

99. **De Berardinis.** Tuberculosis of the conjunctiva. *Ibid.*

100. **Valude** and **Morax.** Bilateral lymphoid infiltration of the retrotarsal folds. *Ann. d'ocul.*, cxxvii., p. 190.

101. **Morax.** A case of dermo-epithelioma of the conjunctiva. *Bull. de la soc. d'opht. de Paris*, Feb. 4, 1902.

102. **Schapringer.** A clinical contribution to congenital "Schurze" of the conjunctiva. *Zeitschr. f. Augenheilk.*, vii., p. 53.

103. **Suker.** A separate gumma of the caruncle and ocular conjunctiva. Report of a case with a complete bibliography appertaining thereto. *Amer. Journ. of Ophth.*, March, 1902.

104. **Wadsworth** and **Verhoeff.** A case of melanotic giant-cell sarcoma of the limbus associated with an implanted secondary growth on the lower lid. *Trans. Amer. Ophth. Soc.*, 1901.

105. **Hepburn.** Hunterian chancre of the caruncle. Right eye. *Ibid.*

106. **Andrade.** A case of ophthalmia neonatorum caused by the diplobacillus of Morax and Axenfeld. *Amer. Journ. Med. Sciences*, Feb., 1902.

107. **Steiner.** On trachomatous spots in the Malay. *Annals of Ophth.*, Jan., 1902.

MORAX (92) calls attention to the frequency of mixed infections of the conjunctiva. The frequent epidemics described by ophthalmologists in Egypt as acute epidemics of trachoma with corneal ulcers are to be regarded as acute conjunctival inflammations in the trachomatous. The added acute affection is usually due to the Weeks bacillus and occasionally by the gonococcus. Lakah and Khouri have shown that the number of cases of blennorrhœa in the trachomatous is increased in the months of July and August. BERGER.

In cases of trachoma without profuse secretion, ARLT (94) dusts in citrate of copper mixed with sugar 1:10 or 1:20 or even unmixed, and also rubs in a 5–10 % salve (glycerine with starch) with which massage is performed for half a minute two or three times a day. The action is as great as that of sulphate of copper without being painful. Trachomatous pannus is quickly improved.

Corneal ulcers and any iodine treatment contra-indicate the use of the citrate.

GOLDZIEHER (95) seeks to cure trachoma in its incipient stages by surgical measures. The old trachoma therapy—the indiscriminate use of copper—was responsible for the habitual condition of irritation, the traumatic keratitis and pannus, the shrinking of the tarsus, and the like. When there is no secretion he employs surgical procedures: with slight infiltration the galvano-cautery is sometimes sufficient; with dense granulations and infiltration of the entire tarsus he uses expression with Knapp's roller forceps, in general anæsthesia or after injecting 3–4 % cocaine or eucain solution beneath the retrotarsal folds. Extensive pannus he treats with the galvano-cautery.

WERSCHBITZKY (96) from his experiments draws the following conclusions: 1. Ichthyol cures trachoma of the first and second degree in 2–5 weeks. 2. In trachoma of the third degree there is recovery without resort to surgical means in half the cases in 3–8 weeks. 3. In trachoma of the fourth degree ichthyol has little value. 4. The disadvantage of ichthyol is the severe burning pain that it causes. HIRSCHMANN.

MRONGOVIUS (97) finds that 4 % ichthargan does not affect the healthy cornea. The expression of the granulations and the use of 2–3 % solution of ichthargan cures trachoma in 1½–3 weeks. HIRSCHMANN.

VALUDE and MORAX (100) observed in a man of fifty-six the formation of a lymphoma in the retrotarsal folds of both eyes without swelling of the lymph glands. BERGER.

STEINER (107) describes a peculiar discoloration of the conjunctiva of the upper lid in trachoma of the Malay. It occurs in the form of an irregular network of black dots and lines or as a more or less regular black patch. Microscopic examination shows the pigment to be in the lowest stratum of the epithelium, mostly in the epithelial cells. ALLING.

XII.—CORNEA.

108. **Fuchs.** On nodular opacities of the cornea. *Arch. f. Ophth.*, liii., 3.

109. **Le Gentil.** Parenchymatous keratitis and deafness. *Thèse de Paris*, 1902.

110. **Zirm.** A contribution to the treatment of hypopyon keratitis. *Centralbl. f. Augenheilk.*, xxvi., 3, p. 77.

111. **Handmann.** On the treatment of rodent ulcer of the cornea. *Klin. Monatsbl. f. Augenheilk.*, xl., p. 221.

112. **Hoppe.** First help for lime injuries of the eyes. *Centralbl. f. Augenheilk.*, Feb., 1902.

113. **Guillery.** On calcium opacities of the cornea and a procedure for clearing them up. *Arch. f. Augenheilk.*, xliv., 4, p. 310.

114. **Noiczewski.** A case of radical cure of keratoconus by operative means (keratectomy). *Centralbl. f. Augenheilk.* Feb., 1902.

115. **Badel.** Three cases of keratoconus (immediate and remote results of surgical intervention). *Gaz. hebd. d. sciences méd. de Bordeaux*, Sept. 15, 1901.

116. **Voltz.** On the colloid degeneration of corneal scars. *Inaug. Dissert.*, Freiburg-i.-Br., 1902.

117. **Sachs, M.** Contributions to operative ophthalmology. On the loosening of anterior synechias after trephining of the cornea. *Zeitschr. f. Augenheilk.*, vii., 1, p. 37.

118. **Panas.** Epibulbar tumors of the sclero-corneal limbus. *Arch. d'opht.*, xxii., 1, p. 1:

119. **Fumagalli.** Primary angiosarcoma (perithelioma) of the cornea developing in an old scar. *Klin. Monatsbl. f. Augenheilk.*, xl., p. 38.

120. **Utermöhlen.** On scleritis, based on two cases of cycloscleritis. *Dissertation*, Amsterdam, 1902.

121. **Feilchenfeld.** Rheumatic sclerokeratitis, specific subacute cyclitis following a traumatic ulcer of the cornea. *Centralbl. f. Augenheilk.*, 1902, p. 5.

122. **Stoewer.** Subconjunctival perforation of the sclera by a dart. *Zeitschr. f. Augenheilk.*, vii., p. 217.

123. **De Schweinitz.** Relapsing traumatic bullous keratitis with cases. *Ophth. Record*, Feb., 1902.

124. **Gruening.** A case of sclero-corneal cyst. *Trans. Amer. Ophth. Soc.*, 1901.

The eight cases examined by FUCHS (108), which he regards as similar to those described by Groenouw and compares with the grill-shaped keratitis, began with mild inflammatory symptoms and were characterized by: 1. Marked unevenness of the cornea. 2. Gray, mostly round patches in the pupillary area, superficial and even elevated above the level of the cornea. 3. A diffuse opacity of the cornea which appears under the loupe finely stippled. The spots change in the course of years and mostly increase. Abrasion of the cornea led to improvement. Trephining with the object of transplantation furnished material for microscopic study. The superficial corneal lamellæ were swollen and at some points frayed out, and pervaded with an amorphous substance. The subjacent lamellæ showed altered staining qualities with thionin. No Bowman's membrane was discoverable; inflammatory signs were wanting. In regard to

the etiology, experiments on animals with similar corneal changes pointed to thyroid changes.

ZIRM (110) writes again of the method of treating hypopyon keratitis that he has used since 1899. He uses bichloride vaselin 0.01–50 and xeroform once daily. The galvano-cautery is used freely, and the cornea is often perforated. The tear sac is washed out with protargol. Besides, he uses atropine or scopolamin, warm fomentations, and subconjunctival injections of 10 per cent. salt solution. Dionin has given him remarkable results.

In a man of twenty-four, STOLTING and HANDMANN (111) transplanted a double pedunculated conjunctival flap over a rodent ulcer of the cornea, but it healed nowhere, and in the course of nine months the ulcer spread over the entire cornea, then the process ceased, leaving a diffuse opacity with $V = \frac{1}{200}$.

In a second case the floor and undermined edge of the ulcer were touched every second day for three weeks with tincture of iodine. This prevented the painful progressions of the ulcer, the eye became free from irritation, and a milky white scar remained in which the corneal tissue was greatly thinned, but did not bulge forward. $V = \frac{5}{4}$.

HOPPE (112) recommends that in cases of fresh lime burns of the eye a thin lanolin salve with 2 % holocain in a tube should be squeezed into the eye. This relieves the pain and prepares the eye for the attentions of the physician.

The primary opacities of the cornea which appear after lime burns and are to be differentiated from the later results of the injury, inflammation, or ulcer, are believed by GUILLERY (113), like Andreae, to be organic combinations—namely, albuminate of calcium, whose solubility in salmiac Guillery demonstrated in a test tube and in living rabbits. Experiments on the living with old opacities showed that eye baths of 20 % salmiac could be borne without discomfort. The opacities cleared in a marked manner. Guillery will experiment with the cataphoric effect of the constant current.

FUMAGALLI (119) designates his case as the only reliably diagnosed case of primary sarcoma of the cornea. It had developed from a seven-year-old scar from an injury and rested broad and fungus-shaped upon the entire cornea.

UTERMÖHLEN (120) has advanced the question whether scleritis is to be regarded as a primary or a secondary affection.

He comes to the following conclusions after the pathological examination of two eyeballs enucleated for "scleritis" and a series of clinical observations:

1. There is no reason for distinguishing a clinical picture of episcleritis from scleritis, except in cases of Fuchs's episcleritis periodica fugax.

2. Attacks of scleritis which develop together with an inflammatory swelling of the episcleral tissue (Schlodtmann) are of a particular clinical type and may be designated "sclero-episcleritis."

3. On practical grounds at present simple scleritis must be differentiated from sclerocyclitis.

4. Pathologically the independent existence of simple scleritis has not been proven.

5. At times scleritis is the result of tuberculous infection, but this probably is true in but a small number of cases. JITTA.

FEILCHENFELD (121) treated a case of deep marginal keratitis with a crescentic infiltration at the upper limbus, with atropine, mercurial salve, and moist dressings, for a time. The ulceration increased, however, and was not held in check by the galvanocautery. Finally it was cured by diaphoretic treatment which was ordered in view of rheumatic pains.

In his second case Feilchenfeld undertook the management of a corneal ulcer which had been treated with medicaments and mechanically for three weeks, having been caused by a trauma. In the other eye there was cyclitis, which led to a general examination of the body and the discovery of syphilis. With a simple bandage and treatment by inunction there was recovery in two weeks.

STÖWER'S (122) patient while looking down was struck by a dart from a blow gun, which passed through the upper lid into the sclera anterior to the equator. There was some prolapse of vitreous and also chemosis of the conjunctiva. The scleral perforation was sutured, the tension arose to the normal, and the acuteness and field of vision became normal.

A cyst-like growth forming an elevation encircling three-fourths of the cornea, encroaching upon it and extending into the adjoining sclera, is described by GRUENING (124). The mass measured 8 *mm* in height and 10 *mm* in width and resembled an inflated intestine. It did not communicate with the anterior chamber. ALLING.

Sections XIII–XVIII. Reviewed by DR. O. BRECHT, Berlin.

XIII.–LENS.

125. **Lezenius.** A case of naphthalin cataract. *Klin. Monatsbl. f. Augenheilk.*, xl., p. 129.

126. **Hirschberg.** An unusual cataract operation. *Deutsche med. Wochenschr.*, xxviii., p. 217.

127. **Becker, Adolf.** The relation of cataract to struma. *Inaug. Dissert.*, Giessen, 1902.

128. **von Hippel, E.** On spontaneous rupture of the lens capsule and expulsion of the nucleus from the eye. *Beitr. z. Augenheilk.*, xlix., p. 74.

129. **Blumenthal.** On the prevention and treatment of secondary cataract. *Report of the Ophth. Section of the VIII. Pirogoff Congress at Moscow*, Jan. 4–10, 1902.

130. **Grab.** On changes in the location of the lens in their etiological and therapeutic aspects. *Inaug. Dissert.*, Zurich, 1901.

131. **Tyschnenko.** Clinical reports of traumatic luxation of the lens. *Wojenno Med. Journ.*, ii., 1902.

132. **Wanner.** Subconjunctival injections in infectious processes after cataract operations. *Inaug. Dissert.*, Tübingen, 1902.

LEZENIUS (125) observed a case of napthalin cataract in an otherwise healthy man who for a stomach disturbance took of an emulsion of naphthalin non-depur., 5 : 200 ol. ricini, within 13 hours, and 8–9 hours later was almost entirely blind. V = fingers at 1.5 *m* each ; concentric contraction of the fields. In the lens, in the form of lamellar cataract, numerous sharply outlined opacities of various forms with a diffuse delicate grayish cloudiness between them. The retina was pale and cloudy, the vessels narrow, the temporal half of the disc pale, and there was a small light-red spot in the left macula. The author warns against the use of unpurified naphthalin.

HIRSCHBERG (126) attempted to couch a cataract in an idiot of thirty-six, extraction in narcosis not being deemed advisable, but on account of the softness of the lens the attempt was unsuccessful. He was able, however, to cut out the inner-upper fifth of the lens, and later the entire lens shrunk, giving the effect of a discission.

BECKER (127) from his observations concludes that a relationship between cataract and struma has not been proven, and that cataract with goitre is most probably due to an auto-intoxication.

VON HIPPEL (128) adds a note to Meller's paper, stating that in his paper published in *Graefe's Arch.*, xl., 1, on siderosis

bulbi, he had described rupture of the anterior capsule of the lens, without discussing the significance of this occurrence.

BLUMENTHAL (129) recommends for preventing secondary cataract after the extraction of senile cataract a careful removal of the cortical masses, particularly when there is insufficient mydriasis, since these masses irritate the iris and cause dense complicated secondary cataracts. The operation for uncomplicated secondary cataract is never an urgent one. The author operated from above, without a speculum, with a double-edged needle. For extraction he has modified the pince-ciseaux.

GRAB (130) gives a statistical report of the cases of luxation of the lens seen in the Zurich Clinic since 1862 and those seen by Prof. Haab in his private practice. He divides them into: (1) ectopia lentis, 18 cases, or 56.8 %; (2) luxatio lentis spontanea, 36 cases, or 28.8 %; (3) luxatio lentis traumatica, 71 cases, or 56.8 %. By ectopia he means cases in which the congenitally displaced lens still is fixed fast in its supporting apparatus.

The causes of spontaneous luxation are for the most part high myopia, cyclitis, choroiditis, shrunken traumatic cataract, etc. In ectopia one tries glasses or resorts to discission. The fate of eyes with dislocated lenses is usually a sad one. Discission is indicated in subluxation of low degree. In complete luxation without complications one waits, but if complications arise extraction should be attempted. In traumatic luxation with healthy vitreous extraction is recommended, in spontaneous luxation and liquid vitreous couching may be done. A lens luxated into the anterior chamber should be extracted.

WANNER (132), after an experience of 12 cases, recommends subconjunctival injections of silver or mercurial preparations particularly in purulent processes after cataract extraction. Salt hastens absorption in the anterior and vitreous chambers. Injections of bichloride doubtless have an antiseptic effect, but also many unpleasant after-affects, such as pain, long-continued hyperæsthesia, chemical action upon the conjunctiva, and obliteration of the subconjunctival lymph spaces.

XIV.–IRIS.

133. **Schrecker.** On tuberculosis of the iris. *Inaug. Dissert.*, Berlin, 1902.

134. **van Duyse.** Persistent pupillary membrane adhering to the cornea. *Bull. de la soc. belge d'opht.*, Nov. 24, 1901.

135. **Snell, A. C.** A report of a case of dermoid cyst of the iris not preceded by trauma. *Annals of Ophth.*, Jan., 1902.

136. **Gruening.** Sarcoma of the iris. *Trans. Amer. Ophth. Soc.*, 1901.

137. **Alt.** A case of traumatic retroflexion of the iris, anatomically examined. *Amer. Journ. of Ophth.*, Jan., 1902.

138. **Hepburn.** Primary tuberculosis of the iris. *Trans. Amer. Ophth. Soc.*, 1901.

139. **Bogoslawsky.** A case of cyclopia cyclencephalia. *Protocolle des Cherson'schen Aerztlichen Vereins*, 1900–1901.

SCHRECKER (133) describes a case of tuberculosis of the iris which showed the tubercle form in an extraordinary characteristic way. He discusses in detail the differential diagnosis, prognosis, and therapy of this disease. At first general measures are undertaken; in case of doubt inunctions are employed, in proper cases iridectomy. If the eye is in great danger tuberculin injections should be used. The final resort is enucleation.

SNELL (135) reports the case of a woman thirty-four years of age who, about five years before, had observed a small yellow spot on the iris, which gradually increased in size. Apparently growing from the iris and incorporated in it was an oval pearly white mass, 6 *mm* by 4 *mm*. Two hairs were projecting from the tumor. The eye was blind and painful from secondary glaucoma and was enucleated. The author believes the case to be of congenital origin. ALLING.

The peculiarity in BOGOSLAWSKY'S (139) case was a double pupil. The monster came from a family of degenerates.

HIRSCHMANN.

(*To be continued.*)

BOOK REVIEWS.

I.—**A Treatise on Diseases of the Eye, Nose, Throat, and Ear.** For Students and Practitioners. By various authors. Edited by W. C. POSEY, A.B., M.D., Philadelphia, and JONATHAN WRIGHT, M.D., Laryngologist to the Brooklyn and Manhattan Eye and Ear Hospitals. Cloth $7. Leather $8. 1902. Philadelphia: Lea Brothers & Co.

A large, heavy —15 pounds—volume of 1238 glazed pages, far from pleasing to the sense-organ of sight which occupies more space than the three other sense-organs together. There have been 28 authors at work (the name of the second editor is omitted in the list), among them 4 Englishmen and 1 Canadian. Whether there was such an urgent need to "produce a work that should treat these cognate specialties from the standpoint of the highest authority" (publishers' circular), after the *American Textbook of Diseases of the Eye, Ear, Throat, and Nose* (60 authors), edited by De Schweinitz and Randall, 1899, has had a sale of x thousand copies, must be left to the responsibility of the publishers from whom "Drs. Posey and Wright accepted the joint editorship." As to the price, the publishers state that "the production of an entirely new and original volume of nearly 1250 pages, with 650 engravings, and 35 inset plates, largely in colors, and to price it at $7 in cloth is a phenomenal undertaking in the manufacture of medical books." When we peruse this volume as to its intrinsic value, we are glad to confess that it is very great. We have gone over the ophthalmological part, which alone would appeal to the readers of these ARCHIVES, and have found in it a great deal of lucid presentation and accurate practical instruction. Here and there we might wish that the descriptions were shorter and somewhat more precise, the plates truer to nature, and the inset colored plates less appalling (look at Plate XIII., facing p. 347). Colored Plate I., facing page 23, illustrating an exceedingly common and long-known subject, says, on page 24, "conjunctival congestion is diagnostic of conjunctivitis" (Plate I., Fig. 2). The Reviewer believes if he had to make the diagnosis of Figure 2, he would say at once—iritis.

Chapter I., by Dr. W. C. POSEY, is "On the Examination of the Eye," 52 pages, containing the usual description in a satisfactory manner.

Chapter II., pp. 53–74, by W. N. SUTER, "On the Physiology of Vision," is very good, showing that the author is no mere copyist.

Chapter III.—"Refractive Errors in General." By A. DUANE. A very good and concise exposition of this rather difficult subject. The author is celebrated for his learning and accuracy, yet there is a popular mistake in the theory of astigmatic refraction, page 76, line 7 from below. "Instead of there being one principal focus for all meridians . . . there are a number of foci, one for each meridian, and these foci lie one behind the other." This, in astigmatic refraction, is not exact, plausible though it appear. There are only two meridians whose refracted rays unite in a focus, the two principal ones, whereas all the others have no foci, none of their rays crossing any other. Sturm, a French physicist, determined mathematically the peculiar form of the pencil of the refracted rays when a homocentric pencil passes through one or several indifferently curved, non-spherical surfaces of separation (*Poggendorff's Annalen*, Bd. 65, 1845). The surface of the cornea comes nearest to a triaxial ellipsoid.

This—not strictly correct—supposition that the intermediate meridians have foci between those of the principal meridians, used here and there in the continuance of Dr. Duane's article, has no influence on the results of the deductions, as only the principal meridians are of account. The article of Duane is excellent.

Chapter IV.—"Motions of the Eye." By Dr. CASEY A. WOOD. Pp. 145–191. Treats of the normal motions and all their errors—insufficiency, strabismus, paralysis; their diagnosis and treatment, optical and operative. It is up to the newest American standpoint with appreciation of European views and methods.

Chapter V.—"Orbit, Lachrymal Apparatus, and Lids." Dy Dr. R. A. REEVE. Pp. 192–257. There are also a few pages on "Diseases of the Accessory Sinuses." The article makes a judicious selection among the multitude of operations on the lids, with the illustrations to be seen in every textbook.

Chapter VI.—"Diseases of the Conjunctiva, Cornea, and Sclera." Pp. 258–330. By Dr. JOHN E. WEEKS. A fair description of these important diseases, with a number of illustrations, mostly copied. Conjunctivitis is divided into simple and bacterial—as far as the etiological factor has not been or has been determined, viz., simple conjunctivitis, lachrymal conjunctivitis (the Reviewer thinks that this is contagious and for wounds or ulcers of the cornea very dangerous), vernal conjunctivitis, conjunctivitis

folliculosa simplex, trachoma or granular conjunctivitis; the forms in which the etiological factor has been determined—acute contagious conjunctivitis (pink eye), caused by a small bacillus (Koch–Weeks), also produced by the pneumococcus (Gifford and others), gonococcus, diphtheria bacillus, etc.

Chapter VII.—"Embryology of the Eye. Diseases of the Uveal Tract and Vitreous." By H. V. WÜRDEMANN. This is quite an interesting chapter.

Chapter VIII.—"Sympathetic Ophthalmia." By H. GIFFORD. Pp. 390–416. Foreign bodies: their extraction, symptoms, and course. Theories. Treatment: neurectomy, enucleation, artificial vitreous, prothesis.

Chapter IX.—"Retina; Optic Nerve and its Cerebral Origin." By T. HOLMES SPICER, F.R.C.S. Pp. 417–472. A very good article. The earlier and the later (Golgi and Ramón y Cajal) anatomy of the retina, its vascular affections, and their consequences are duly considered. The optic nerve is traced with singular clearness and completeness from the retina (with reference to the visual field), through the orbit and along its winding path to the primary ganglia, the optic radiation, the perceptive centre, the memory centre, the speech and motor centres, with their communications in one and both hemispheres, together with their functional significance, pathological importance, and localizing value. He states, however, that the course of the visual fibres from the external geniculate bodies to the optic radiation is not yet known (p. 470). Lesions of the posterior part of the posterior limb of the internal capsule are reported to have been followed by homonymous hemianopsia, which is supplemented, however, by Henschen, who says that in such cases the external geniculate bodies or the optic tract are always interfered with at the same time. Word blindness, ataxia, agraphia, dyslexia, amnesic color blindness, visual hallucinations, mind blindness. Concerning the singular phenomenon that in bilateral homonymous hemianopsia the region of the macula lutea of either eye does not lose its function, he mentions the two explanations: *a*, the increased blood supply; and *b*, the representation of each macula lutea in the visual centre of each eye. Ferrier's view of crossed amblyopia, by the existence of a higher visual centre in the angular gyrus, in which the presentation of the macular region of the opposite eye was greater than that of the same side, is, for man at least, disbelieved by most authors.

Chapter X.—"Diseases of the Crystalline Body." By E. C. ELLETT. With a good many original microscopic drawings of diseased lenses by E. S. Thompson of the laboratory of the Manhattan Eye and Ear Hospital; otherwise very elementary.

Chapter XI.—"Glaucoma." By TREACHER COLLINS, F.R.C.S., England. Anatomical details; theories of glaucoma. Pathological investigations, with original drawings. Prognosis. Treatment. Very instructive and convincing article. Jonnesco advances in the report of eight cases, among other statements, these results: disappearance of the attacks of irritative glaucoma, considerable permanent improvement of vision in all cases in which complete atrophy of the optic nerve had not set in. The author adds: "In other surgeons' hands, though the operation has sometimes been attended with success, disastrous results have also occurred. Some patients have died as the result of the operation. Increased tension, though reduced for a time, has returned in some cases. Symptoms of tachycardia and exophthalmus have developed." (See page 563, at the end.)

Chapter XII. — "Disturbances of Vision without Apparent Lesion." By E. G. STARR. Short, but very readable.

Chapter XIII.—"The Eye in Relation to General Diseases." By C. F. CLARK. Pp. 583–652. Very useful.

Chapter XIV.—"General Preparation for Operations on the Eye." By CLARENCE A. VEASEY.

Chapter XV.—"The Technique of the Pathological and Bacteriological Examination of the Eye." By EDW. A. SHUMWAY. A well written article, essential to the eye surgeon that wants to base his diagnosis and treatment on scientific methods and matured conclusions.

As the reader will see from these excerpts, there is a good deal of new and valuable material in this weighty book. If I were asked by the numerous possessors of the *American Textbook of the Eye, Ear, Nose, and Throat*, by De Schweinitz and Randall (1899), whether it would not be better to go over this work a second time than to read its new companion edited, and well edited (1902), by Posey and Wright at the bidding of another great Philadelphia book-producing firm, I would say, at first, "I know not;" secondly, "Do as I have done": take the new book, read it, compare it with the other, and if you possess the precious gift of concentration of mind,—in plainer English, attentive reading—the gain will be a hundred times greater than the expense.

H. K.

II.—**Die Motilitätsstörungen des Auges,** von Dr. ERNEST E. MADDOX. Translated into German by Dr. W. ASHER, Leipzig, 1902.

Maddox's book, distinguished by its simplicity and directness, is particularly valuable to the beginner in this department, which has been made unnecessarily difficult by the introduction of a large number of pointless subtleties. The German translator has not spoiled its easy perspicuity. The anatomy and physiology of the muscular apparatus are chiefly taken from French and German literature, with no new views as far as we could find, but the secured stock of knowledge is faithfully presented, and credited to the proper sources.

The author, to increase the effect, recommends stretching of the soft cicatrix with a squint hook one or more days after the operation.

In case the deviating eye in strabismus makes no accommodative adduction on moving the finger near the root of the nose, a tenotomy of the external rectus is without any effect. Advancement is here indicated.

Stress is laid on the post-operative optical treatment.

The palsies of the ocular muscles occupy sixty-four pages. The drawings and circumstantial rules in diagnosis of our student-years are reproduced. A great deal of mnemotechnique is given for the benefit of the learner. One rule includes almost all that is required: "Learn the physiological function of each muscle, and remember that the double-image repeats in position, motion, and wheeling the normal function of the non-paralyzed muscle; for instance, the superior oblique moves the cornea down and out, and wheels [turns the upper end of] the vertical meridian inward. The double-image is lower, homonymous, and turned with the upper end nasally." The student need not speak in a whisper when he has such a case before him. Of course, he must know his anatomy and physiology. The analysis of an old case of ocular paralysis is often extremely difficult, but nobody is required to unravel hopelessly entangled conditions anywhere. There is a great deal of interesting detail in the ocular palsies which will interest any searching mind.

The rest of the book, one hundred and three pages, is occupied by descriptions of the modern methods of examination and treatment in the lesser degrees of disturbances of motility such as they have been brought forward, chiefly by American investigators—Stevens, Risley, Prince, Jackson, Duane, Swan Burnett, Morton, Savage; in England, by Maddox himself, Priestley Smith, Berry; in France, Javal, Landolt, Panas; in Germany, Listing Ruete,

A. v. Graefe, Albrecht Graefe, Hering; in Holland, Donders and Snellen; in Sweden, Gullstrand.

This book will be extensively read. H. K.

III.—**Chirurgie de l'Œil et de ces Annexes.** By Dr. F. TERRIEN, formerly Chief of the Ophthalmological Clinic in the Paris Faculty. 311 figures in the text. 432 pp. Published by G. Steinheil, 2 rue Casimir-Delaigne, 1902. Price, 15 francs.

In the *Traité de Médecine Opératoire* of Berger and Hartmann, the operations on the eye are treated by Dr. F. Terrien, formerly Professor Panas's Chief of Clinic at the Hôtel-Dieu. This volume is published separately and is gotten up in quite an elaborate manner. The subject-matter is very explicit; the indications, technique, and complications of the various operations are fully given. We find the views and teachings of Panas frequently reproduced. The illustrations are quite a feature, being unusually large, clear, and generally correct. The drawings for the excellent Panas's entropion operation are misleading, as the section of the tarsus should be made nearer the inferior border than is given in the sketch; it should correspond to the cicatricial groove on the inner surface of the tarsus.

The subject of cataract is exhaustively treated. Simple extraction is recommended as the method of choice. In secondary cataract, if the capsule be thick and resisting it should, according to the author, be extracted after five or six months with the Liebreich-Panas forceps. Ordinarily no or slight loss of vitreous follows. In youthful cataracts discission is abandoned for linear extraction. In diabetic cataract he advises always to perform the combined extraction. Enucleation is not thought necessary in the treatment of the malignant conjunctival epibulbar tumors. In the treatment of strabismus, both eyes should be operated upon, either by double tenotomy or double advancement of the antagonists.

In addition to the purely surgical affections some of the usual inflammations are described, and of these we should like to mention the excellent chapter on conjunctival inflammations. These are discussed from the modern bacteriological standpoint. A bacterial examination of the secretion should be made, and on the authority of Morax it is stated that the cover-glass examination is sufficient and more reliable than cultures.

The book is excellent and has been most carefully written. The make-up and wealth of illustration testify to a very commendable liberality on the publisher's part. A. K.

FIG. 1.

FIG. 2.

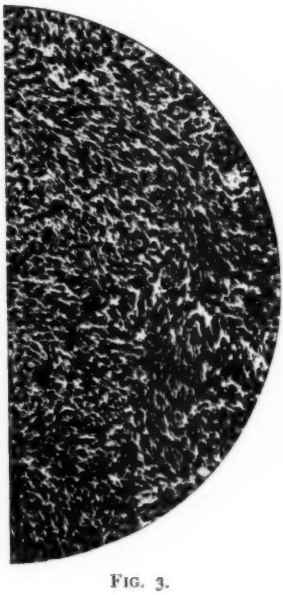


FIG. 3.

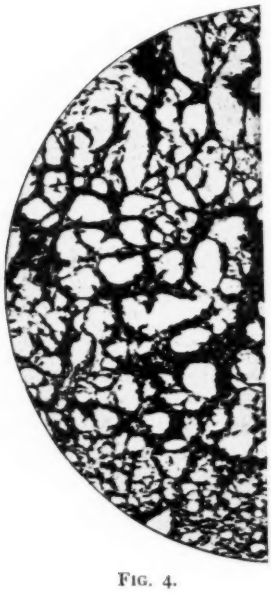


FIG. 4.

DESCRIPTION OF THE ILLUSTRATIONS ON TEXT-PLATE II.

FIG. 1.—The upper nodule is a primary spindle-cell sarcoma. The large tumor of the limbus and the small nodule beside it are secondary growths, the latter invading the eye.

FIG. 2.—Photograph of sectioned eye (horizontal), showing secondary sarcoma of the limbus and involvement of the sclera, choroid, and ciliary body. (The infiltrated choroid is not easily to be distinguished from the subretinal coagulum.)

FIG. 3.—Photomicrograph (x 98) of the upper scleral nodule. (Primary spindle-cell sarcoma.)

FIG. 4.—Photomicrograph (x 98) of the secondary tumor of the limbus, showing cancellous structure. The intraocular portion of the growth showed an entirely similar structure.